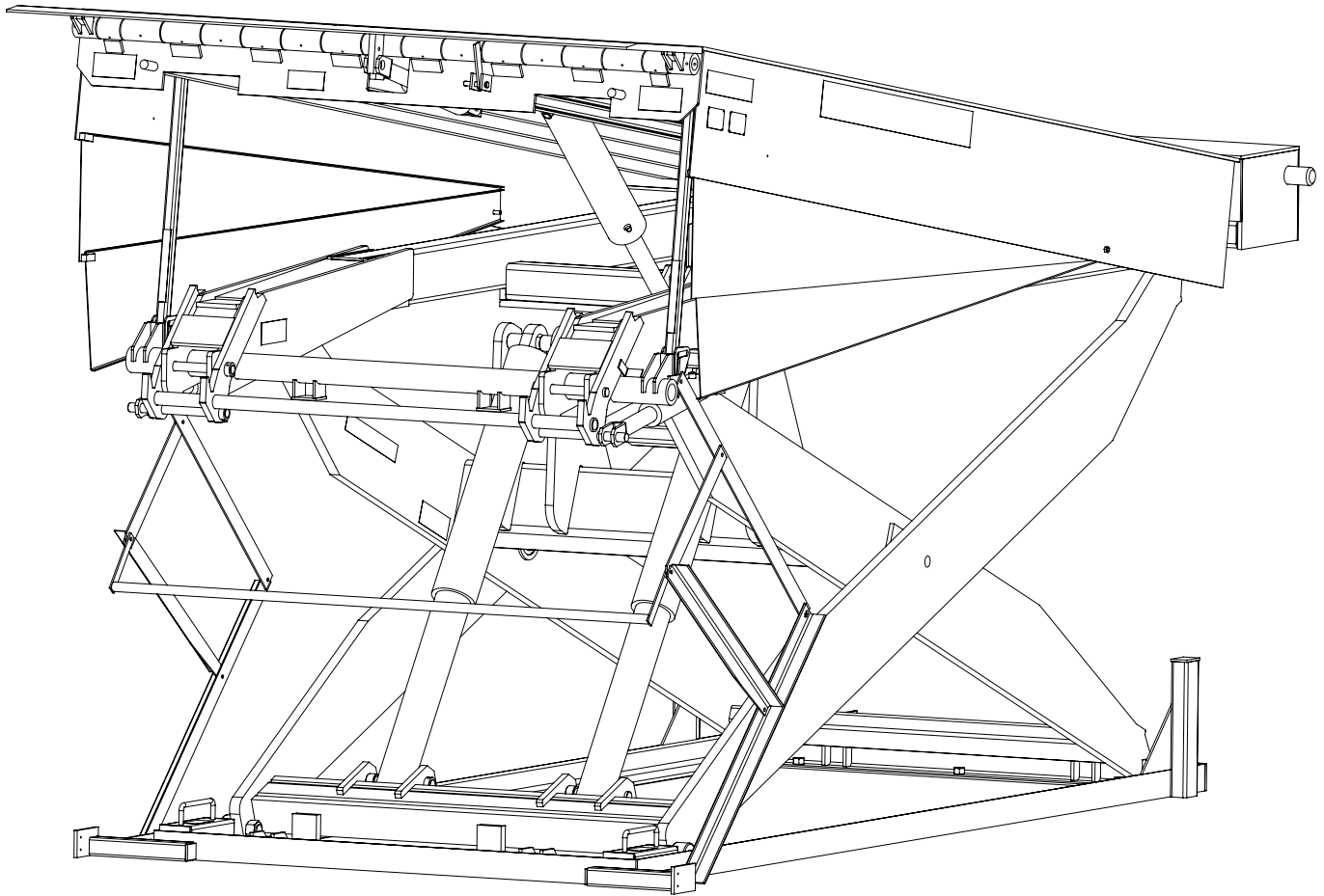


Dock Leveler and Lift Combo



This manual applies to dock leveler and lift combos manufactured beginning May 2012 with the serial numbers 61045677 and higher

⚠ WARNING

Do not install, operate or service this product unless you have read and understand the Safety Practices, Warnings, Installation and Operating Instructions contained in this User's Manual. Failure to do so could result in death or serious injury.

User's Manual

Installation, Operations,
Maintenance and Parts

Part No. 6009080C

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INTRODUCTION

Welcome and thank you for choosing this dock leveler and lift combo from 4Front Engineered Solutions, Inc. This user's manual contains information that you need to safely install, operate and maintain the dock leveler and lift combo. It also contains a complete parts list and information about ordering replacement parts. Please keep and read this user's manual before using your new dock leveler and lift combo.

SAFETY SIGNAL WORDS

You may find safety signal words such as DANGER, WARNING, CAUTION or NOTICE throughout this Owner's Manual. Their use is explained below:



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

▲ DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

▲ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

▲ CAUTION

Indicates a potentially hazardous situation which, if not avoided may result in minor or moderate injury.

NOTICE

Notice is used to address practices not related to personal injury.

SAFETY PRACTICES

⚠ WARNING

Read these safety practices before installing, operating, or servicing the dock leveler. Failure to follow the safety practices could result in death or serious injury.

If you do not understand the instructions, ask your supervisor to explain them to you or call your authorized 4Front Engineered Solutions, Inc. distributor.

OPERATION

Use restricted to trained operators.

Follow procedures on placard posted near the dock leveler and lift combo.

Do not use this unit to service vehicles outside its intended working range:

8' long dock leveler and lift combo is 12" above dock.
10' long dock leveler and lift combo is 15" above dock.
12' long dock leveler and lift combo is 18" above dock.

All units service 12" below dock.

While in Leveler Mode, do not operate leveler portion with equipment, material or people on the ramp or lip.

Do not operate the dock leveler and lift combo when anyone is in front of it unless they are securing the maintenance strut.

Stay clear of the dock leveler and lift combo when it is moving.

Ensure there are no obstructions which may interfere with the operation of the dock leveler and lift combo.

KEEP HANDS CLEAR OF ALL HINGES AND PINCH POINTS AT ALL TIMES. Do not use hands to position the leveler portion in a vehicle or in storing the leveler.

Stay clear of the leveler portion unless the lip is supported by the vehicle platform or the ramp is stored. An unsupported leveler can lower unexpectedly.

OPERATION, continued

Do not use the dock leveler and lift combo if it looks broken or does not seem to work properly. Inform your supervisor at once.

Do not stand in the driveway between the dock leveler and lift combo and a backing vehicle.

Before chocking wheels or engaging vehicle restraint, dump air from air ride suspensions and chock vehicle wheels or lock vehicle in place with a vehicle restraining device and set brakes before loading or unloading.

Ensure lip plate avoids contact with vehicle sides and cargo. If the lip does not lower to vehicle platform, reposition the vehicle.

Do not use a fork truck or other material handling equipment to lower the ramp.

Move all equipment, material or people off the dock leveler and lift combo and store unit at dock level before allowing the vehicle to pull out.

Store the dock leveler and lift combo at dock level after use. If the dock leveler and lift combo does not operate properly using the procedures in this manual, **DO NOT USE THE DOCK LEVELER AND LIFT COMBO.** Call your local distributor for service.

SAFETY PRACTICES, continued

INSTALLATION, MAINTENANCE AND SERVICE

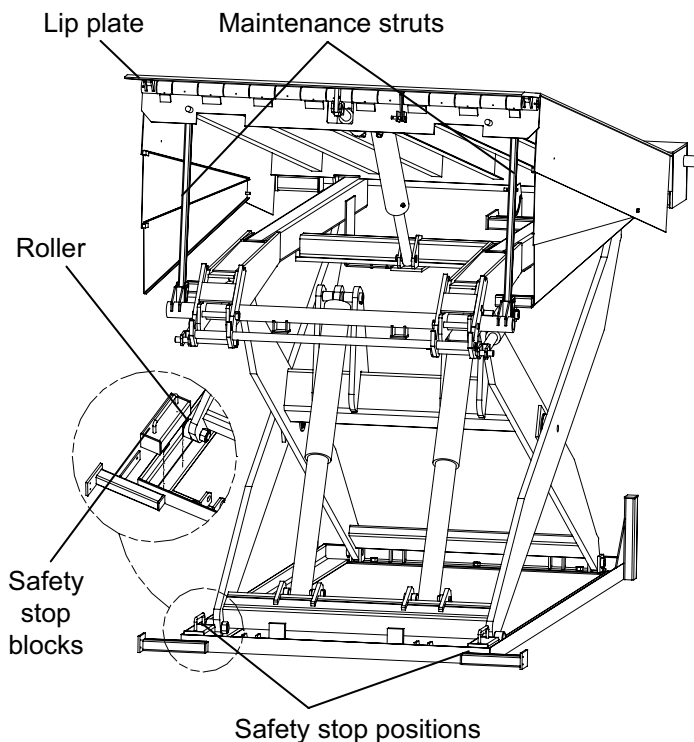
Place barricades on the dock floor around the dock leveler pit and in the driveway in front of the pit while installing, maintaining or repairing the dock leveler and lift combo.

Be certain, before entering the dock leveler and lift combo pit or doing any maintenance or repair under the dock leveler and lift combo that:

- 1) The both safety stop blocks are in place on the scissor frame. See Fig. 1.
- 2) The both maintenance struts are securely supporting the leveler portion. See Fig. 1.
- 3) The power is disconnected and properly tagged or locked out.

If it is necessary to troubleshoot inside the control box with the power on, **USE EXTREME CAUTION**. Do not place fingers or uninsulated tools inside the control box. Touching wires or other parts inside the control box may cause electrical shock, serious injury or death. All electrical troubleshooting or repair must be done by a qualified technician and must meet applicable codes.

Fig. 1



OWNER'S RESPONSIBILITIES — LIFT

It is the responsibility of the user/purchaser to advise the manufacturer where deflection may be critical to the application.

INSPECTION AND MAINTENANCE

The dock leveler and lift combo shall be inspected and maintained in proper working order in accordance with the manufacturer's operating/maintenance manual and safe operating practices.

Only trained and authorized personnel shall be permitted to perform maintenance on the dock leveler and lift combo.

MAINTENANCE PERSONNEL SHALL:

Read and understand the manufacturer's operating/maintenance manual, and all safety rules and labels, prior to performing any maintenance or service on the equipment.

Full time unlimited access to the manufacturer's operating/maintenance manual.

REMOVAL FROM SERVICE

Any dock leveler and lift combo not in safe operating condition such as, but not limited to, excessive leakage, missing rollers, pins or fasteners, any bent or cracked structural members, cut or frayed electrical wiring or hydraulic lines, damaged or malfunctioning controls or safety devices, etc. shall be removed from service until it is repaired to the original manufacturer's standards. All repairs shall be made by qualified personnel in conformance with the manufacturer's instructions.

REPAIRS

All repairs shall be made by qualified personnel in conformance with the manufacturer's instructions.

OPERATORS

Only trained and authorized personnel shall be permitted to operate the dock leveler and lift combo.

BEFORE OPERATION

Before using the dock leveler and lift combo:

Read and/or have explained and understood, the manufacturer's operating instructions and safety rules.

Inspect the dock leveler and lift combo for proper operation and condition. Any suspect item shall be carefully examined and a determination made by a qualified person as to whether it constitutes a hazard. All items not in conformance with the manufacturer's specification shall be corrected before further use of the dock leveler and lift combo.

DURING OPERATION

The dock leveler and lift combo shall only be used in accordance with the manufacturer's operating/maintenance manual.

Do not overload the dock leveler and lift combo.

Ensure that all safety devices are operational and in place.

MODIFICATIONS OR ALTERATIONS

Modifications or alterations of the dock leveler and lift combo shall be made only with written permission from the original manufacturer. These changes shall be in conformance with all applicable provisions of this standard and shall be as safe as the equipment was before modification. These changes shall also satisfy all safety recommendations of the original equipment manufacturer for the particular application of the dock leveler and lift combo.

OWNER'S RESPONSIBILITIES — DOCK LEVELER

The owner's responsibilities include the following:

The owner should recognize the inherent danger of the interface between dock and transport vehicle. The owner should, therefore, train and instruct operators in the safe use of dock leveling devices.

When a transport vehicle is positioned as closely as practicable to a dock leveling device, there shall be at least 4" of overlap between the front edge of the lip and the edge of the floor or sill of the transport vehicle.

Nameplates, cautions, instructions and posted warnings shall not be obscured from the view of operating or maintenance personnel for whom such warnings are intended.

Manufacturer's recommended periodic maintenance and inspection procedures in effect at date of shipment shall be followed, and written records of the performance of these procedures should be kept.

Dock leveling devices that are structurally damaged or have experienced a sudden loss of support while under load, such as might occur when a transport vehicle is pulled out from under the dock leveling device, shall be removed from service, inspected by the manufacturer's authorized representative, and repaired as needed before being placed back in service.

The owner shall see that all nameplates, caution and instruction markings or labels are in place and legible and that the appropriate operating and maintenance manuals are provided to users.

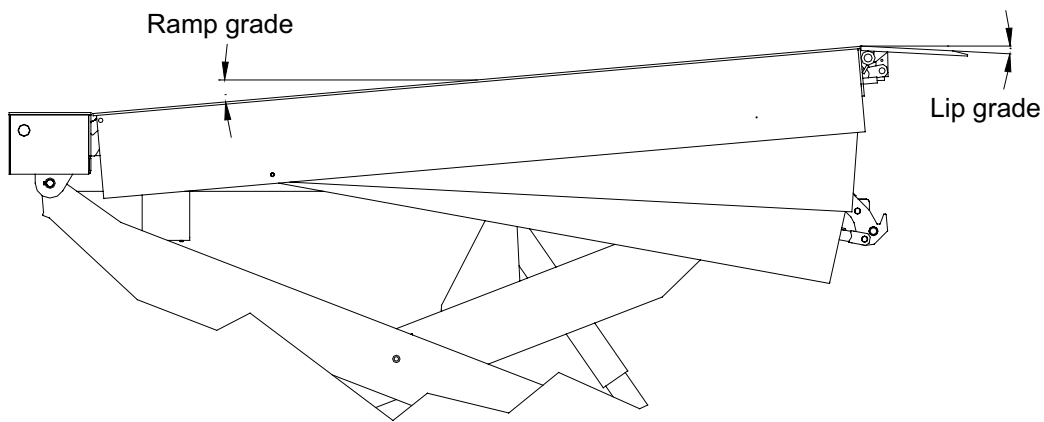
Modifications or alterations of dock leveling devices shall be made only with written permission of the original manufacturer.

When industrial vehicles are driven on and off transport vehicles during the loading and unloading operation, the brakes on the transport vehicle shall be applied and wheel chocks or positive restraints that provide the equivalent protection of wheel chocks engaged.

The dock leveler should never be used outside its vertical working range or vertical lifting range or outside the manufacturer's labeled rated capacity. It must also be compatible with the loading equipment and other conditions relating to the dock.

RAMP AND LIP GRADES

Fig. 2



Vehicle bed position from dock, (in.)		Ramp and lip grades, % for each dock leveler and lift combo length					
		8' dock leveler and lift combo		10' dock leveler and lift combo		12' dock leveler and lift combo	
		Ramp	Lip	Ramp	Lip	Ramp	Lip
Above Dock	18.0	---	---	---	---	14.2	7.4
	16.0	---	---	---	---	12.7	5.6
	15.0	---	---	14.6	7.8	12.0	4.9
	12.0	15.1	8.4	11.9	5.1	9.7	2.9
	10.0	12.8	6.1	10.1	3.3	8.2	1.0
	8.0	10.5	3.8	8.2	1.4	6.7	0.0
	6.0	8.2	1.4	6.4	0.3	5.4	-1.4
	4.0	6.0	0.7	4.8	-2.0	4.0	-2.8
	2.0	4.0	-2.8	3.3	-3.5	2.7	-4.1
	0.0	1.9	-4.8	1.7	-5.2	1.3	-5.5
Below Dock	-2.0	0.0	-6.8	0.0	-6.8	0.0	-6.8
	-4.0	-1.9	-8.9	-1.5	-8.5	-1.3	-8.3
	-6.0	-3.9	-11.0	-3.1	-10.1	-2.6	-9.6
	-8.0	-5.9	-13.0	-4.8	-11.8	-4.0	-11.0
	-10.0	-7.9	-15.1	-6.4	-13.5	-5.3	-12.4
	-12.0	-9.9	-17.1	-8.0	-15.2	-6.7	-13.8

Ramp and lip grade, 4° lip bend, 18" lip

INSTALLATION — REMOTE MOUNT

REMOTE MOUNT INSTALLATION

Fig. 3

▲ WARNING

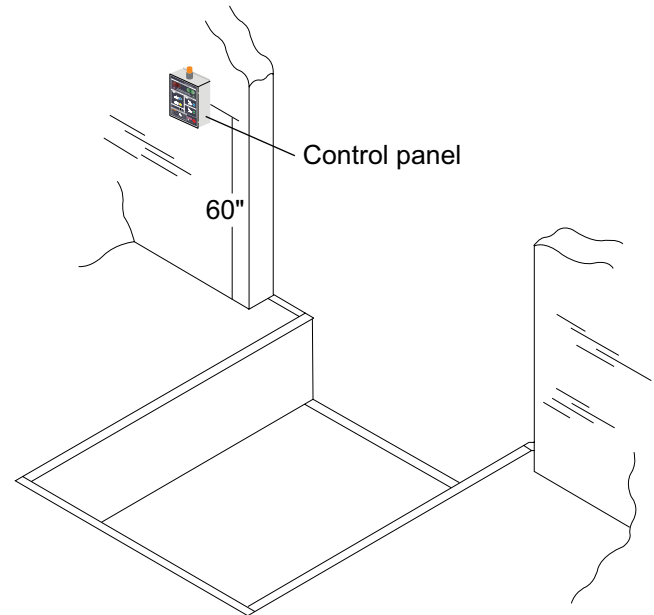
Before installing the dock leveler and lift combo, read and follow the Safety Practices on page 3-4 and the Operating Instructions on pages 33-42. Failure to follow the Safety Practices could result in death or serious injury.

THE FOLLOWING TOOLS ARE REQUIRED:

- Crane or heavy forklift truck capable of lifting the appropriate weight at 6' (2m) load center. See Fig. 4 for expected weight.
 - Roto-hammer with 3/4" bit.
 - Hydraulic jack.
 - Welder.
 - Short and long pry bars.
 - Assorted SAE open end wrenches.
 - Allen wrench set.
1. Check the entire dock leveler and lift combo pit for proper construction to certified approval drawings. Ensure the pit walls are square and plumb. Scrape clean the three embeds in the pit floor. Sweep clean the entire pit floor. Check electrical service running to the pit to ensure it agrees with the phase and voltage of the pump/motor and control box supplied with the dock leveler and lift combo. See tag attached to pump/motor electrical cord and wiring diagram located inside the control box cover.

▲ DANGER

Power to control box must be from fused disconnect supplied by others. Fuse size for a dual element motor protected time delay type fuse can be no greater than 225% of motor FLA. Before doing any electrical work, make certain the power is disconnected and properly tagged or locked out. All electrical work must be done by qualified technician and must meet all applicable codes. If it is necessary to make troubleshooting checks inside the control panel with the power on, USE EXTREME CAUTION. Do not place fingers or uninsulated tools inside the control box. Touching wires or other parts inside the control box could cause electrical shock, death or serious injury.



INSTALLATION — REMOTE MOUNT, continued

2. Verify that the voltage of the dock leveler and lift combo matches the facility's power supply. Mount the control panel on the wall near the front of the dock leveler and lift combo and connect the power supply. The recommended mounting height of the control panel is approximately 60" from the floor to the pushbuttons. See Fig. 3 for detail, review approval drawings for specific details if applicable.
3. Mount the lift power unit on the finished floor within close proximity to the 4" conduit that supplies the hydraulic hose from the pit. Review approval drawings for specific details if applicable.
4. Power needs to be supplied to the lift power unit from the control panel. Review electrical schematics for termination details within the control panel.
5. Electrical connections to the two solenoid valves (SV6 and SV7) will need to be made on the lift power unit. Terminate the lift solenoid cable (cable 616) to the appropriate receptacle on the bottom side of the control panel. Review electrical schematics for termination details.

Fig. 4

Dock leveler and lift combo weight chart (remote mounted lift power unit)	
Size (width x length)	Weight in lbs (kg)
6 x 8	7000 (3175)
6.5 x 8	7200 (3265)
7 x 8	7400 (3356)
6 x 10	8000 (3629)
6.5 x 10	8200 (3720)
7 x 10	8400 (3810)
6 x 12	9000 (4082)
6.5 x 12	9200 (4173)
7 x 12	9400 (4264)

NOTE:

The lip end of the dock leveler and lift combo is slightly heavier than the rear hinge end.

▲ WARNING

Inadequate lifting equipment or practices can cause a lifted load to fall unexpectedly. Make sure lifting chain or other lifting devices are in good condition and have a rated capacity exceeding the lifting load for the angle used. See Fig. 4 for expected weight. Never allow anyone to stand on or near the dock leveler and lift combo when it is being lifted or placed in the pit. Failure to follow this warning can allow the dock leveler and lift combo to fall, tip, or swing into people, resulting in death or serious injury.

INSTALLATION — REMOTE MOUNT, continued

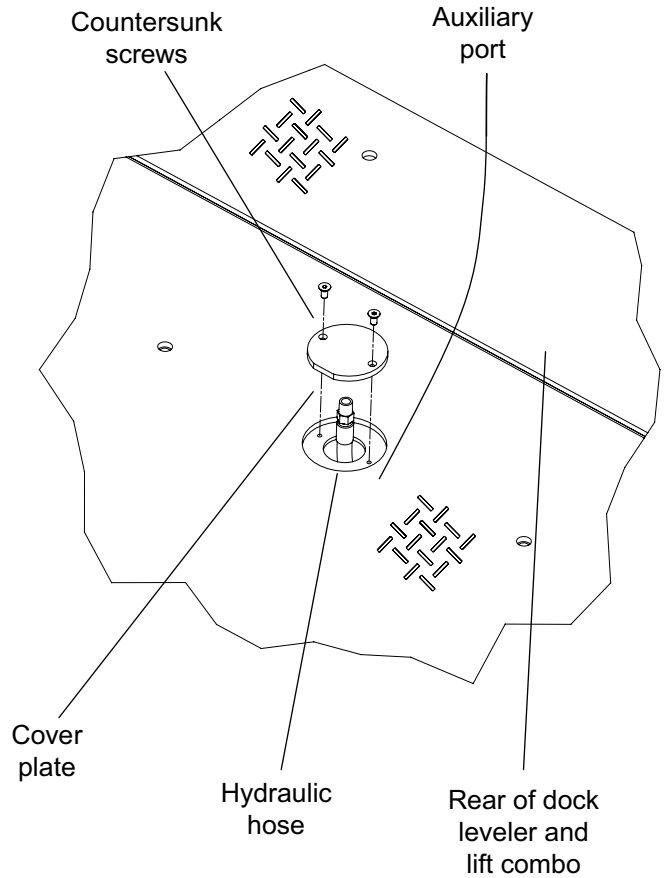
6. The dock leveler and lift combo weight is shown on Fig. 4.
4. Ensure that the crane has sufficient lift capacity to safely carry this load. Fig. 5

The entire weight of the dock leveler and lift combo shall be lifted from the four lifting rings mounted on the deck surface. **Lifting under the side or end frame angles will damage the dock leveler and lift combo.** The preferred lifting method is with a 4-way chain sling hooked to the four lifting lugs on the deck. If short chains are used, a spreader bar is recommended to reduce side loading.

Adjust the sling chains so that the lip end is slightly higher than the rear hinge end to prevent damage to the front curtain brackets. The recommended lift point is 6" away from center, closer to the front (lip end) of the dock leveler and lift combo.

If the dock leveler and lift combo cannot be set into the pit, it must always rest on a flat surface.

7. Pick up the dock leveler and lift combo with a 4-way chain sling hooked to the four lifting lugs on the deck. Inspect the hoses and fittings to ensure that they have not loosened during shipment. Set the dock leveler and lift combo in the pit while taking care to prevent damage to the sides of the platform and the front curtain brackets. Position the dock leveler and lift combo so that there is an equal space along each side of the platform and a 3/4" space at the rear.
8. The four lifting lugs are attached by shipping bolts which extend down to the lift frame. Loosen the nuts which secure the lifting lugs and then remove the threaded rods. Keep all lifting hardware in case the dock leveler and lift combo must be removed in the future.
9. Locate the hydraulic hose that shipped loose with the dock leveler and lift combo. Connect one end to the remote mounted power unit, above the Solenoid valves. The other end will connect to the dock leveler and lift combo through the auxiliary port. See Fig. 5 for location.
10. Loosen the two countersunk screws from the auxiliary port. Remove the auxiliary port cover plate from the deck surface of the dock leveler and lift combo. Keep all hardware, the cover plate will be reattached after this phase of installation.



INSTALLATION — REMOTE MOUNT, continued

11. Pull the hydraulic hose from the auxiliary port a sufficient distance to gain access to the fitting, approximately 12". Connect the auxiliary hose with the hydraulic hose attached to the remote mounted power unit. Ensure the routing of this hose avoids any pinch points or other hazards.
12. Ensure all electrical and hydraulic connections are made and power is supplied to the control panel.
13. Enter Service Mode by pressing and holding the reset pushbutton (located on the righthand side of the control panel) for 5 seconds. Within the panel, verify the PLC has booted and the PLC run light is solidly illuminated. Ensure the input 19 (door interlock) is illuminated. If it is not, jumper wires must be correctly installed to satisfy this condition.
14. Verify Service Mode is active. The red and green lights located on the panel should be flashing. Press and hold the LIFT RAISE pushbutton and note that the scissor lift motor is running. The lift should start to rise. If within 10 seconds the lift does not rise, the motor polarity may need to be reversed.
15. With the platform raised to floor level, the frame must be shimmed so that all four corners of the platform are level with the floor.

Measure and record the height from each corner of the dock leveler and lift combo to the floor. Then select shims approximately equal to the height difference recorded for each corner. If one side is more than 3/8" lower than the other side, insert shims under the low side approximately 3/4 of the difference and repeat the measurement.

NOTE:

Leveling adjustments are easier to check if the highest corner of the platform is even with the floor. Shims will be used to raise the low corners so that all four corners on the platform are level.

▲ DANGER

Do not enter the pit area under the dock leveler and lift combo unless the scissor motor is off and both safety stop blocks are placed in front of the scissor arm rollers.

INSTALLATION — REMOTE MOUNT, continued

16. Use the three front and three rear leveling bolts to lift the frame until the shims can be inserted. A jack and a short piece of 4" x 4" extending to the upper scissor frame can be used to support the weight and make the front leveling screw easier to adjust. The rear 4" x 10" shims must extend under the rear scissor arm pivot on each side. These 4" x 10" shims will be placed 1/2" from the back edge and 1/2" from the outside edge. See Fig. 9 for more detail on the rear shim locations.

17. The front roller track shims must be placed under the entire length of the front roller track. This shim length will vary depending on dock leveler and lift combo length. The roller track shims shall be placed 1/2" from the front of the scissor frame and 1/2" from the outside edge. After the shims are in place, loosen the leveling bolts so that the weight is resting only on the shim plates. See Fig. 8 for more detail on shim locations.

NOTE:

Carefully stack the shims in all four locations so that the pit floor embeds are visible for welding.

18. Repeat the measurements and adjust the shimming until the platform is level. The platform does not need to be at the same height as the floor, but all four corners must be the same distance above or below the floor. The front of the dock leveler and lift combo may be up to 1/8" higher than the rear, but should not be lower.

Check that there is a space of 3/4" between the rear of the platform and the pit wall. Ensure that there is an equal space on both sides of the platform. If the spaces are not correct, the frame can be shifted using a pry bar or small hydraulic jack between the pit wall and the ends of the frame. Do not use the jack near the middle of the frame side angles.

If the dock leveler and lift combo has been repositioned, re-check the platform for level and shim as required.

19. When the dock leveler and lift combo is properly positioned, remove the safety stop blocks from the lift frame. Operate the unit through the entire range, from fully lowered to fully raised. Watch for any interference with the pit walls. If any interference is found, either remove the obstruction or shift the dock leveler and lift combo in the pit. When the clearances are acceptable, raise the dock leveler and lift combo to floor level. Remove power (panel off) and place both safety stop blocks in front of the lower scissor arm rollers.

Fig. 6

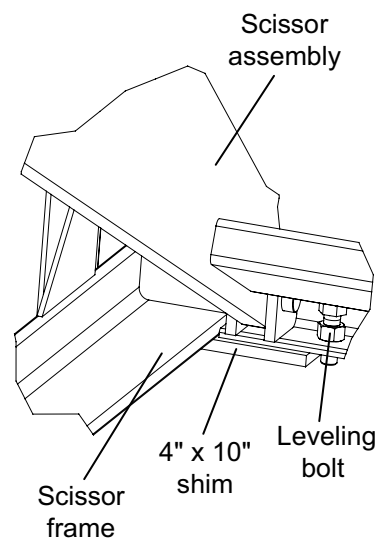
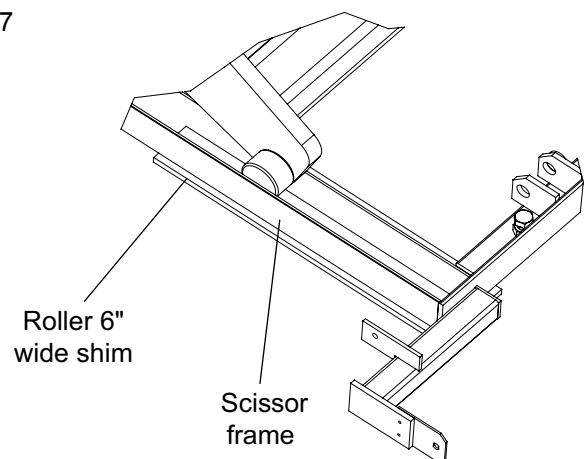


Fig. 7



INSTALLATION — REMOTE MOUNT, continued

▲DANGER

Do not enter the pit area under the dock leveler and lift combo unless the scissor motor is off and both safety stop blocks are placed in front of the scissor arm rollers.

20. When the dock leveler and lift combo has been correctly positioned and leveled. Weld the scissor frame to the shims. Then weld the shims to the pit floor embeds. See Fig. 8 and Fig. 9 for details regarding welding.

NOTE:

Attach the welder ground cable only to the frame, not to the platform or scissor arms.

▲DANGER

Do not enter the pit area under the dock leveler and lift combo unless the scissor motor is off and both safety stop blocks are placed in front of the scissor arm rollers.

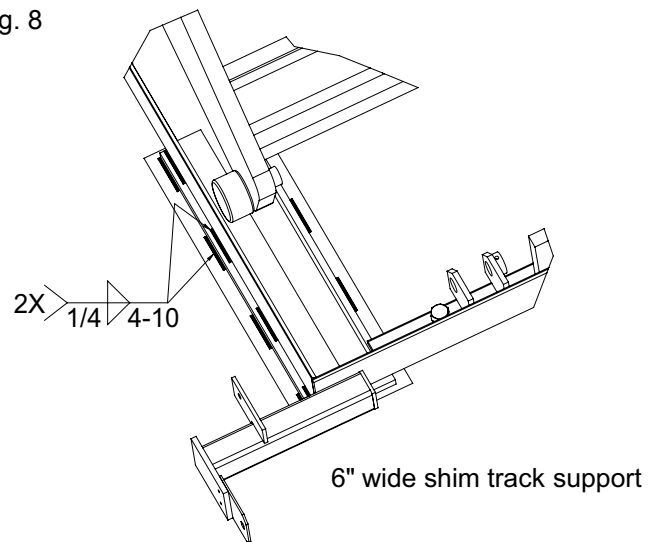
21. Make sure the scissor arms are firmly resting against safety stop blocks, then disconnect the hydraulic hose at the auxiliary port. Before disconnecting, raise the hose assembly above floor level to ensure excess hydraulic fluid will drain back to the tank. Cap both connections.

Reattach the auxiliary port cover plate to the deck assembly. The two countersunk screws should not protrude above the deck surface.

22. Route the remote hydraulic hose through the 4" conduit located near the remote mounted motor.

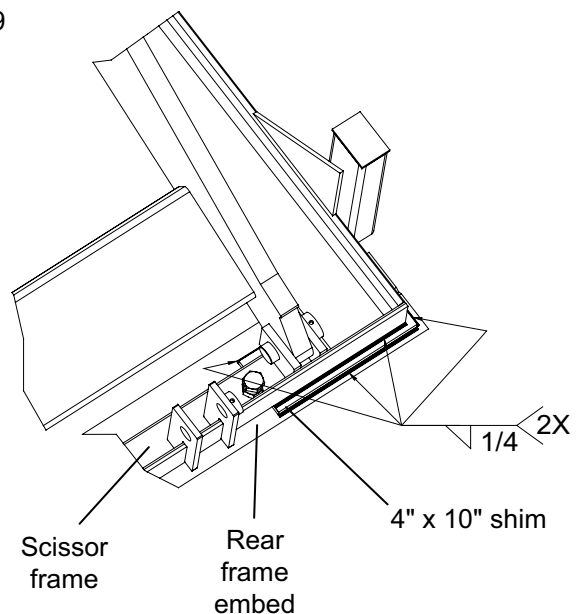
From the pit area, retrieve the remote hydraulic hose and connect it to the hydraulic tee fitting connected to both scissor cylinders. Pull excess hydraulic hose from the conduit for travel above finished floor. See Fig. 10 for detail and location.

Fig. 8



Front Shim Detail

Fig. 9



Rear Shim Detail

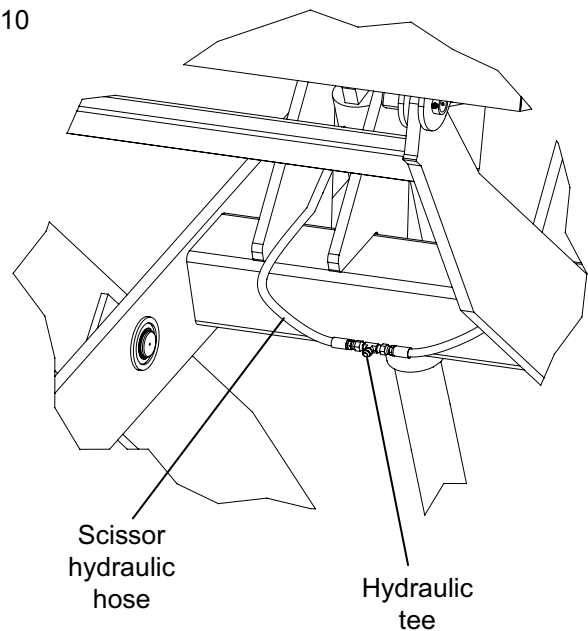
INSTALLATION — REMOTE MOUNT, continued

23. While in the pit, route the bundle of electrical cables through the 3" conduit. Leave excess cable length in the pit area for travel above finished floor. These cables will connect to the proper receptacle on the bottom surface of the control panel. The yellow cable (cable 617) with a 19 pin connector contains 24V signal wiring for the proximity switches. The gray cable (cable 615) with an 8 pin connector contains the 24V signal wiring for the solenoids. The black cable (cable 302) with a 4 pin connector contains the power wiring for the leveler power unit. Review electrical schematics for wiring details if the control panels is not fitted with electrical connectors.

24. Once all electrical connections have been made. Place unit in Service Mode and verify all mode functions are available as follows:

- Press Lift Lower and verify the lift lowers.
- Press Lift Raise and verify the lift raises. Continue to raise the dock leveler and lift combo above floor level to the highest point of travel. Ensure the remote hydraulic hose and all electrical cables have sufficient slack in the line. If needed, put the safety stop blocks in place and pull extra hose cable length through the conduit.
- Press Leveler Raise and verify the deck portion (leveler) raises. There may be a slight delay, but the leveler deck should start to rise. If the deck does not rise, the motor may be running in reverse. Review the electrical schematics to reverse the motor connections within the control panel and try again. Raise the leveler deck to its full height and before it can float back down, press the Stop button. This will hold the deck in the raised position. Extend both maintenance struts and lower the leveler deck by pulling the Stop button out.
- Press Lip Extend and verify the lip extends.
- With the deck raised and positioned on the maintenance struts, press and hold the Leveler Mode pushbutton. Verify both lock pins extend and the lip keepers rotate into position. After the cycle has completed, release the Leveler Mode pushbutton.
- Press and hold the Lift Mode pushbutton. Verify both lock pins retract and the lip keepers rotate downward and the support legs are positioned to support the deck. After the cycle has completed, release the Lift Mode pushbutton.

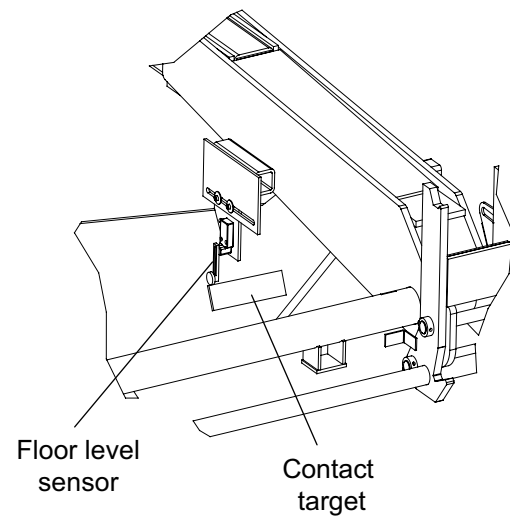
Fig. 10



INSTALLATION — REMOTE MOUNT, continued

- Press the Leveler Raise button to raise the leveler to full height. Press the Stop button and store both maintenance struts.
- Pull the Stop button out and allow the leveler to float down to stored position. The deck should rest on the deck support legs.

Fig. 11



25. While in Service Mode, position the dock leveler and lift combo using the raise and lower pushbuttons so that the back edge of the deck is precisely level with the floor. Use a straight edge to accomplish this (a board or equivalent will make a satisfactory marker when laid across the gap of the lift).

▲ DANGER

Do not enter the pit area under the dock leveler and lift combo unless the scissor motor is off and both safety stop blocks are placed in front of the scissor arm rollers.

26. Check and adjust the position of the floor level sensor located under the front right side of the platform. See Fig. 11 for location and details.
27. Loosen the two socket head cap screws that are fixed in the slot of the sensor back plate. This will allow correct positioning of the floor level sensor. If needed, adjust the height of the arm by loosening the screw in the middle of the sensor.

As shown in Fig. 12, position the arm of the sensor at 25° to the contact tube. When rotating the sensor, a snap can be felt when rotated past 25°.

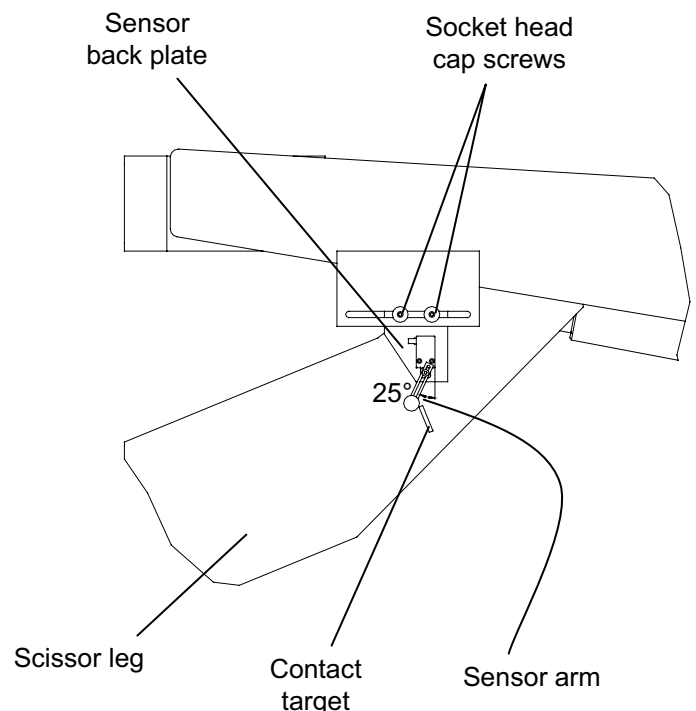
Adjust the sensor arm and sensor to the correct position and retighten.

28. Remove the safety stop blocks from the frame and store the blocks to the side. Lower the dock leveler and lift combo approximately 12" below floor level. Now raise the dock leveler and lift combo. The unit should automatically stop close to floor height. Reposition the floor level sensor if necessary.
29. Raise the dock leveler and lift combo approximately 4" to 6" above floor level. Extend the lock pins using the method described previously. Place a PVC shim bushing over each lock pin. Now place the latch block over each extended lock pin. Orient each latch block as shown in Fig. 13.

NOTE:

The floor level sensor assembly is easily accessed if the leveler platform is raised and placed on the maintenance struts. Raising the leveler deck will not affect the floor level adjustment.

Fig. 12



INSTALLATION — REMOTE MOUNT, continued

30. Lower the platform until it is level with the floor. Remove power (panel off) and slide the latch block to fit snug with the embed pit steel. Make a heavy tack weld to the top and both sides of the latch block, attaching it to the pit steel.

NOTE:

Attach the welder ground cable only to the curb angle, not to the platform scissor arms.

31. After the latch blocks have been tack welded, supply power back to the panel. Place the unit in Service Mode and retract the lock pins. Lower the dock leveler and lift combo several feet below floor level and remove the installation shim bushing from each latch block. Now raise the platform to floor level. It will stop automatically. Extend the lock pins. Carefully inspect the lock pin for proper engagement into the latch blocks. If a pin does not engage properly, note the area of interference. If necessary, remove the latch blocks and repeat the block installation procedure.

32. When the blocks have been properly positioned, lower the dock leveler and lift combo and fully weld the latch blocks in place. See Fig. 14 for weld details.

NOTE:

Fine adjustments can be made to floor level sensing using the PLC's potentiometer, see Fig. 14. Using a jewelers screwdriver or equivalent, rotate the potentiometer clockwise to increase or raise the point at which the deck will stop. Rotate the potentiometer counter-clockwise to decrease or lower the point at which the deck will stop. This affects the automatic stop feature when raising the deck while in LIFT mode.

33. The dock leveler and lift combo has two principal operating modes, "LIFT" and "LEVELER". Note panel indications for mode status.

NOTE:

The light communications switch must be in DO NOT ENTER VEHICLE position to perform a transition sequence.

34. If the unit is not already in LIFT Mode, press the LIFT Mode pushbutton indicator. This will initiate a transition which will place the dock leveler and lift combo into the valid LIFT Mode. When sequencing is complete, verify indications represent a valid LIFT Mode configuration, the Lift pushbutton should be solidly lit. Place the light communications switch to the ENTER VEHICLE position and verify the lip operates normally.

Fig. 13

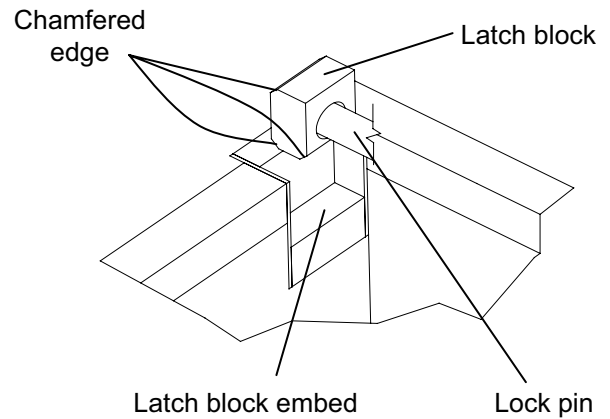


Fig. 14

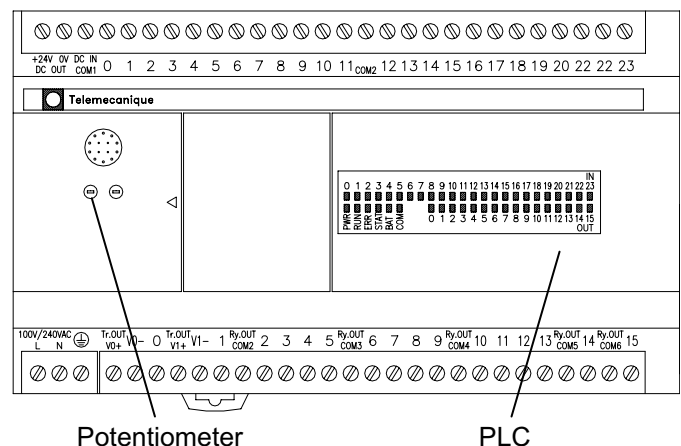
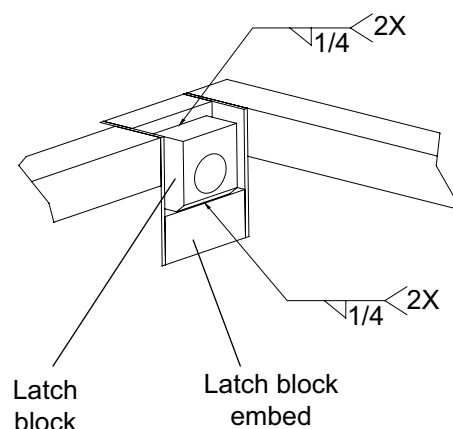


Fig. 15



INSTALLATION — REMOTE MOUNT, continued

35. Place the light communications switch to the DO NOT ENTER VEHICLE position and press the LEVELER pushbutton indicator. The dock leveler and lift combo unit will fall approximately 4" and then raise to finished floor, ensuring a dock level condition. The deck will then rotate upward, the rear lock pins will extend as the lip keepers rotate into place. The deck will then fall until the lip is resting in the lip keepers, and the leveler motor will stop. When sequencing is complete, verify indications represent a valid LEVELER Mode configuration. The indicator light should be solidly lit. If a failure occurs and diagnostics are being reported, refer to the Diagnostics section for details and correct the problem as required. Place the light communications switch to the ENTER VEHICLE position and verify the leveler operated normally.

NOTE:

Again, cycle between modes, LIFT Mode then again to LEVELER Mode to ensure all sequencing is correctly performed. If at any time an error occurs or the sequencing does not finish, consult the troubleshooting section of this manual.

36. The front curtain can be installed only when the unit is in LEVELER Mode. Raise the leveler and put the maintenance struts in place. Put both safety stop blocks in place.

Thread the curtain brackets over the rod of the curtain on each end. Lower the assembly to attach the curtain brackets to the scissor frame mounting location with the provided bolts as shown in Fig. 16. Ensure the rod of the curtain assembly extends through the brackets on each end.

37. Pretension the curtain assembly. Rotate the curtain assembly 5 revolutions, as shown in Fig. 17.
38. Install the rod and the hanger brackets through the curtain fabric. Install the hanger brackets as shown in Fig. 18. Ensure the hanger brackets are installed over the leg cross tube.
39. Operate the dock leveler and lift combo throughout the entire range to check for proper operation of the curtain.
40. Raise the dock leveler and lift combo to dock height and store the unit in Leveler mode.

Fig. 16

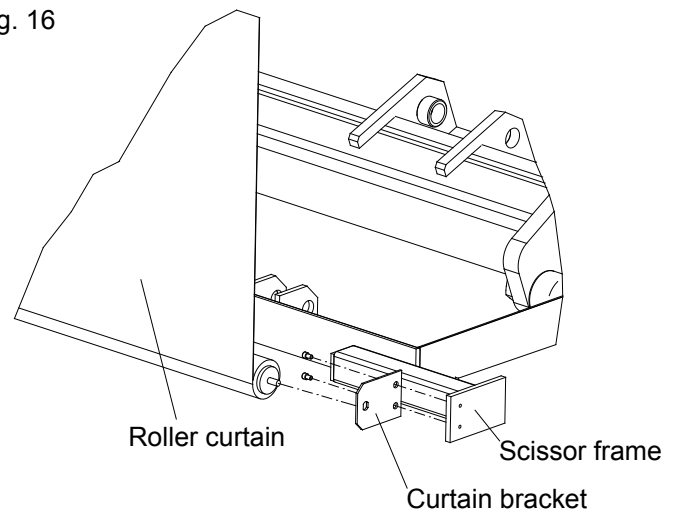


Fig. 17

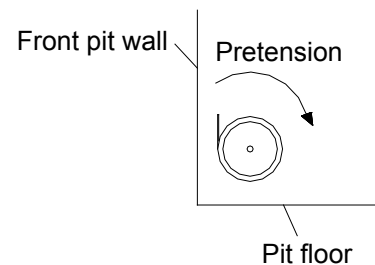
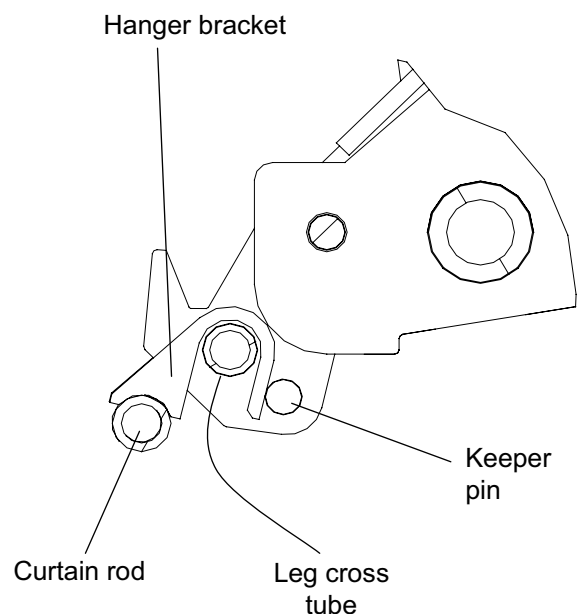


Fig. 18



INSTALLATION — PIT MOUNT, continued

PIT MOUNT INSTALLATION

Fig. 19

▲ WARNING

Before installing the dock leveler and lift combo, read and follow the Safety Practices on page 3-4 and the Operating Instructions on pages 33-42. Failure to follow the Safety Practices could result in death or serious injury.

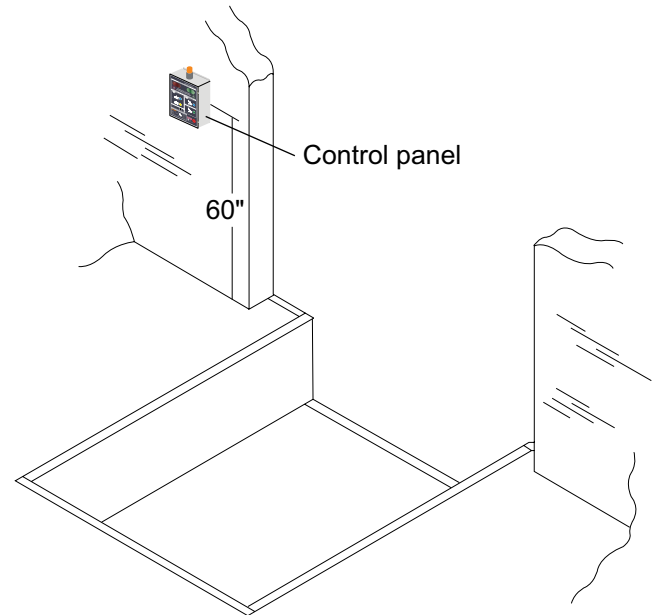
THE FOLLOWING TOOLS ARE REQUIRED:

- Crane or heavy forklift truck capable of lifting the appropriate weight at 6' (2m) load center. See Fig. 20 for expected weight.
- Roto-hammer with 3/4" bit.
- Hydraulic jack.
- Welder.
- Short and long pry bars.
- Assorted SAE open end wrenches.
- Allen wrench set.

1. Check the entire dock leveler and lift combo pit for proper construction to certified approval drawings. Ensure the pit walls are square and plumb. Check electrical service running to the pit to ensure it agrees with the phase and voltage of the pump/motor and control box supplied with the dock leveler and lift combo. See tag attached to pump/motor electrical cord and wiring diagram located inside the control box cover.

▲ DANGER

Power to control box must be from fused disconnect supplied by others. Fuse size for a dual element motor protected time delay type fuse can be no greater than 225% of motor FLA. Before doing any electrical work, make certain the power is disconnected and properly tagged or locked out. All electrical work must be done by qualified technician and must meet all applicable codes. If it is necessary to make troubleshooting checks inside the control panel with the power on, USE EXTREME CAUTION. Do not place fingers or uninsulated tools inside the control box. Touching wires or other parts inside the control box could cause electrical shock, death or serious injury.



INSTALLATION — PIT MOUNT, continued

2. Verify that the voltage of the dock leveler and lift combo matches the facility's power supply. Mount the control panel on the wall near the front of the dock leveler and lift combo and connect the power supply. The recommended mounting height of the control panel is approximately 60 inches from the floor to the pushbuttons. See Fig. 19 for detail, review approval drawings for specific details if applicable.

Fig. 20

Dock Leveler and Lift Combo Weight Chart (Pit Mounted Lift Power Unit)	
Size (width x length)	Weight in lbs (kg)
6 x 8	7200 (3265)
6.5 x 8	7400 (3356)
7 x 8	7600 (3447)
6 x 10	8200 (3720)
6.5 x 10	8400 (3810)
7 x 10	8600 (3900)
6 x 12	9200 (4173)
6.5 x 12	9400 (4264)
7 x 12	9600 (4354)

▲ WARNING

Inadequate lifting equipment or practices can cause a lifted load to fall unexpectedly. Make sure lifting chain or other lifting devices are in good condition and have a rated capacity exceeding the lifting load for the angle used. See Fig. 20 for expected weight. Never allow anyone to stand on or near the dock leveler and lift combo when it is being lifted or placed in the pit. Failure to follow this warning can allow the dock leveler and lift combo to fall, tip, or swing into people, resulting in death or serious injury.

3. The dock leveler and lift combo weight is shown on Fig. 20. Ensure that the crane has sufficient lift capacity to safely carry this load.

The entire weight of the dock leveler and lift combo shall be lifted from the four lifting rings mounted on the deck surface. Lifting under the side or end frame angles will damage the dock leveler and lift combo. The preferred lifting method is with a 4-way chain sling hooked to the four lifting lugs on the deck. If short chains are used, a spreader bar is recommended to reduce side loading.

Adjust the sling chains so that the lip end is slightly higher than the rear hinge end to prevent damage to the front curtain brackets. The recommended lift point is 6" away from center, closer to the front (lip end) of the dock leveler and lift combo.

If the dock leveler and lift combo cannot be set into the pit, it must always rest on a flat surface.

NOTE:

The lip end of the dock leveler and lift combo is slightly heavier than the rear hinge end.

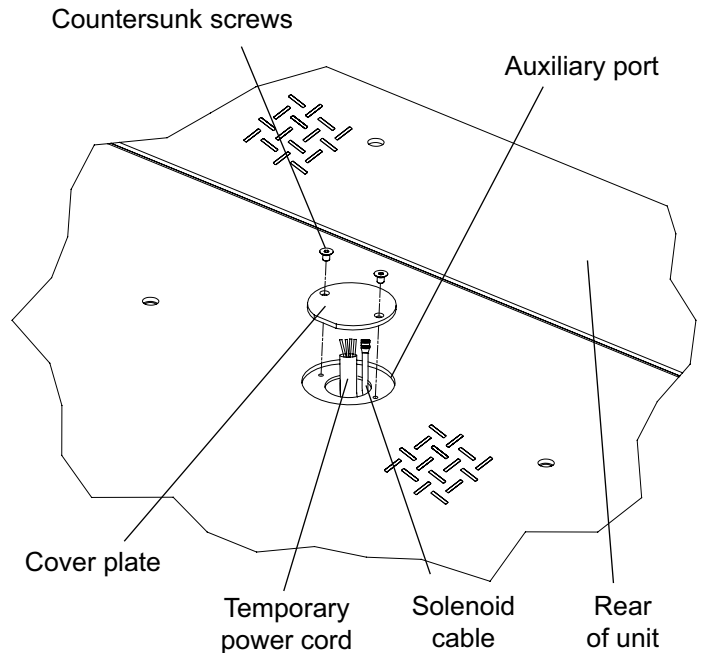
4. Pick up the dock leveler and lift combo with a 4-way chain sling hooked to the four lifting lugs on the deck.

INSTALLATION — PIT MOUNT, continued

Inspect the hoses and fittings to ensure that they have not loosened during shipment. Set the dock leveler and lift combo in the pit while taking care to prevent damage to the sides of the platform and the front curtain brackets. Position the dock leveler and lift combo so that there is an equal space along each side of the platform and a 3/4" space at the rear.

5. The four lifting lugs are attached by shipping bolts which extend down to the lift frame. Loosen the nuts which secure the lifting lugs and then remove the threaded rods. Keep all lifting hardware in case the dock leveler and lift combo must be removed in the future.
6. Locate the temporary power cord and the lift solenoid cable that can be found through the auxiliary port. See Fig. 21 for location.
7. Loosen the two countersunk screws from the auxiliary port. Remove the auxiliary port cover plate from the deck surface of the dock leveler and lift combo. Keep all hardware, the cover plate will be reattached after this phase of installation.

Fig. 21



▲ DANGER

Before doing any electrical work, make certain the power is disconnected and properly tagged or locked out. All electrical work must be done by a qualified technician and must meet all applicable codes. If it is necessary to make troubleshooting checks inside the control panel with the power on, USE EXTREME CAUTION. Do not place fingers or uninsulated tools inside the control box. Touching wires or other parts inside the control box could cause electrical shock, death or serious injury.

8. Connection to the temporary power cord should be made from the auxiliary port to the control panel. Review electrical schematics for termination details.
9. The lift solenoid cable should be pulled from the auxiliary port and connected to the appropriate receptacle on the bottom side of the panel. Review electrical schematics for termination details.

INSTALLATION — PIT MOUNT, continued

10. Ensure the routing of lift solenoid cable and the wiring to the temporary power cord avoid any pinch points or other hazards as the dock leveler and lift combo will rise.
11. Ensure all electrical connections are made and power is supplied to the control panel.
12. Enter Service Mode by pressing and holding the reset pushbutton (located on the righthand side of the control panel) for 5 seconds. Within the panel, verify the PLC has booted and the PLC run light is solidly illuminated. Ensure the input 19 (door interlock) is illuminated. If it is not, jumper wires must be correctly installed to satisfy this condition.
13. Verify Service Mode is active. The red and green lights located on the panel should be flashing. Press and hold the LIFT RAISE pushbutton and note that the scissor lift motor is running. The lift should start to rise. If within 10 seconds the lift does not rise, the motor polarity may need to be reversed.
14. With the platform raised to floor level, the frame must be shimmed so that all four corners of the platform are level with the floor. Measure and record the height from each corner of the dock leveler and lift combo to the floor. Then select shims approximately equal to the height difference recorded for each corner. If one side is more than $\frac{3}{8}$ " lower than the other side, insert shims under the low side approximately $\frac{3}{4}$ of the difference and repeat the measurement.

INSTALLATION — PIT MOUNT, continued

NOTE:

Leveling adjustments are easier to check if the highest corner of the platform is even with the floor. Shims will be used to raise the low corners so that all four corners on the platform are level.

▲ DANGER

Do not enter the pit area under the dock leveler and lift combo unless the scissor motor is off and both safety stop blocks are placed in front of the scissor arm rollers.

15. Use the three front and three rear leveling bolts to lift the frame until the shims can be inserted. A jack and a short piece of 4" x 4" extending to the upper scissor frame can be used to support the weight and make the front leveling screw easier to adjust. The rear 4" x 10" shims must extend under the rear scissor arm pivot on each side. These 4" x 10" shims will be placed 1/2" from the back edge and 1/2" from the outside edge. See Fig. 25 for more detail on the rear shim locations.

16. The front roller track shims must be placed under the entire length of the front roller track. This shim length will vary depending on dock leveler and lift combo length. The roller track shims shall be placed 1/2" from the front of the scissor frame and 1/2" from the outside edge. After the shims are in place, loosen the leveling bolts so that the weight is resting only on the shim plates. See Fig. 24 for more detail on shim locations.

17. Repeat the measurements and adjust the shimming until the platform is level. The platform does not need to be at the same height as the floor, but all four corners must be the same distance above or below the floor. The front of the dock leveler and lift combo may be up to 1/8" higher than the rear, but should not be lower. Check that there is a space of 3/4" between the rear of the platform and the pit wall. Ensure that there is an equal space on both sides of the platform. If the spaces are not correct, the frame can be shifted using a pry bar or small hydraulic jack between the pit wall and the ends of the frame. Do not use the jack near the middle of the frame side angles. If the dock leveler and lift combo has been repositioned, re-check the platform for level and shim as required.

Fig. 22

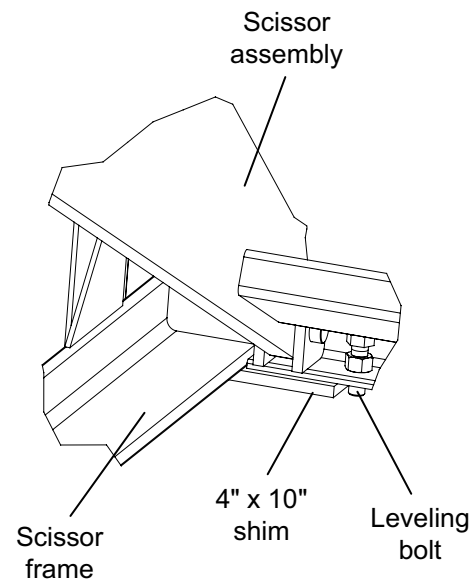
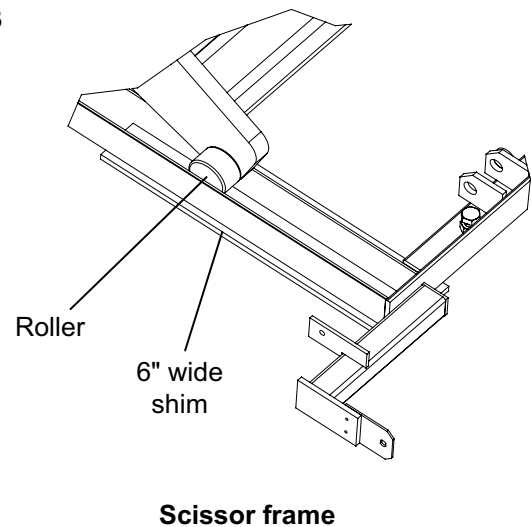


Fig. 23



INSTALLATION — PIT MOUNT, continued

18. When the dock leveler and lift combo is properly positioned, remove the safety stop blocks from the lift frame. Operate the unit through the entire range, from fully lowered to fully raised. Watch for any interference with the pit walls. If any interference is found, either remove the obstruction or shift the dock leveler and lift combo in the pit. When the clearances are acceptable, raise the dock leveler and lift combo to floor level. Remove power (panel off) and place both safety stop blocks in front of the lower scissor arm rollers.

▲ DANGER

Do not enter the pit area under the dock leveler and lift combo unless the scissor motor is off and both safety stop blocks are placed in front of the scissor arm rollers.

19. When the dock leveler and lift combo has been correctly positioned and leveled. Weld the scissor frame to the shims. Then weld the shims to the pit floor embeds. See Fig. 24 and Fig. 25 for details regarding welding.

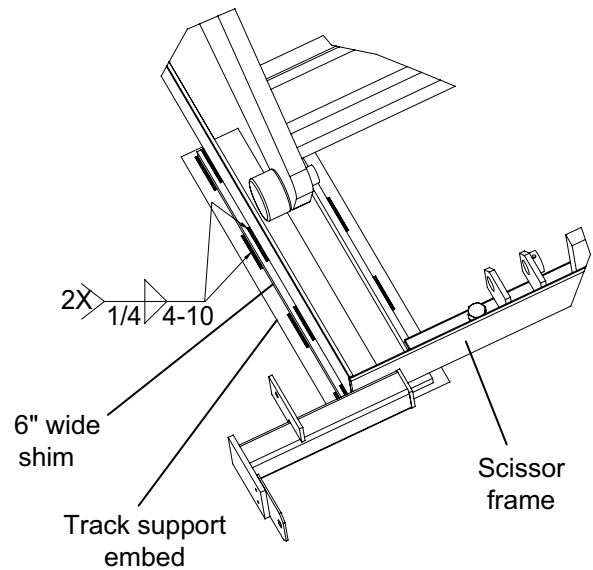
NOTE:

Attach the welder ground cable only to the frame, not to the platform or scissor arms.

▲ DANGER

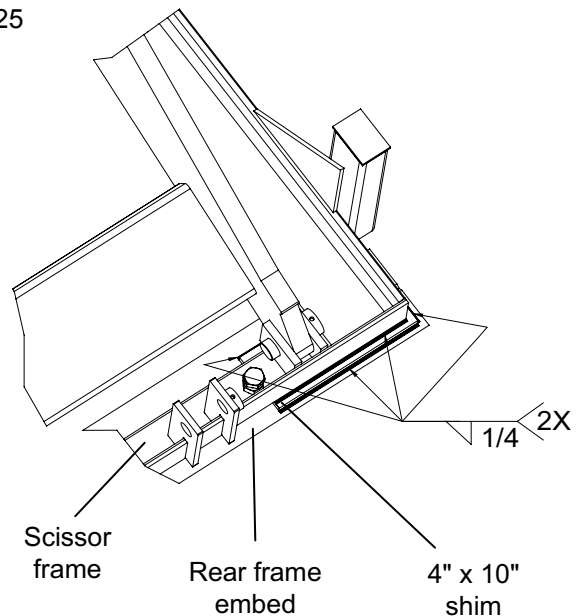
Do not enter the pit area under the dock leveler and lift combo unless the scissor motor is off and both safety stop blocks are placed in front of the scissor arm rollers.

Fig. 24



Front Shim Detail

Fig. 25



Rear Shim Detail

INSTALLATION — PIT MOUNT, continued

20. Disconnect the wiring to the temporary power cord and disconnect the lift solenoid cable from the panel and route the solenoid cable back through the auxiliary port. Reattach the auxiliary port cover plate to the deck assembly. The two countersunk screws should not protrude above the deck surface.

DANGER

Before doing any electrical work, make certain the power is disconnected and properly tagged or locked out. All electrical work must be done by qualified technician and must meet all applicable codes. If it is necessary to make troubleshooting checks inside the control panel with the power on, USE EXTREME CAUTION. Do not place fingers or uninsulated tools inside the control box. Touching wires or other parts inside the control box could cause electrical shock, death or serious injury.

22. With the temporary power removed, permanent power must be provided from the control panel to the junction box located on the pit mounted lift power unit.
23. While in the pit, route the bundle of electrical cables through the 3" conduit. Leave excess cable length in the pit area for travel above finished floor. These cables will connect to the proper receptacle on the bottom surface of the control panel. The yellow cable (cable 617) with a 19 pin connector contains 24V signal wiring for the proximity switches. The gray cable (cable 615) with an 8 pin connector contains the 24V signal wiring for the solenoids. The black cable (cable 302) with a 4 pin connector contains the power wiring for the leveler power unit. Review electrical schematics for wiring details if the control panels is not fitted with electrical connectors.
24. Once all electrical connections have been made. Place unit in Service Mode and verify all mode functions are available as follows:

- Press Lift Lower and verify the lift lowers.
- Press Lift Raise and verify the lift raises. Continue to raise the dock leveler and lift combo above floor level to the highest point of travel. Ensure the remote hydraulic hose and all electrical cables have sufficient slack in the line. If needed, put the safety stop blocks in place and pull extra hose cable length through the conduit.

- Press Leveler Raise and verify the deck portion (leveler) raises. There may be a slight delay, but the leveler deck should start to rise. If the deck does not rise, the motor may be running in reverse. Review the electrical schematics to reverse the motor connections within the control panel and try again. Raise the leveler deck to its full height and before it can float back down, press the Stop button. This will hold the deck in the raised position. Extend both maintenance struts and lower the leveler deck by pulling the Stop button out.
- Press Lip Extend and verify the lip extends.
- With the deck raised and positioned on the maintenance struts, press and hold the Leveler Mode pushbutton. Verify both lock pins extend and the lip keepers rotate into position. After the cycle has completed, release the Leveler Mode pushbutton.
- Press and hold the Lift Mode pushbutton. Verify both lock pins retract and the lip keepers rotate downward and the support legs are positioned to support the deck. After the cycle has completed, release the Lift Mode pushbutton.
- Press the Leveler Raise button to raise the leveler to full height. Press the Stop button and store both maintenance struts.
- Pull the Stop button out and allow the leveler to float down to stored position. The deck should rest on the deck support legs.

INSTALLATION — PIT MOUNT, continued

25. While in Service Mode, position the dock leveler and lift combo using the raise and lower pushbuttons so that the back edge of the deck is precisely level with the floor. Use a straight edge to accomplish this (a board or equivalent will make a satisfactory marker when laid across the gap of the lift).

▲ DANGER

Do not enter the pit area under the dock leveler and lift combo unless the scissor motor is off and both safety stop blocks are placed in front of the scissor arm rollers.

26. Check and adjust the position of the floor level sensor located under the front right side of the platform. See Fig. 26 for location and details.
27. Loosen the two socket head cap screws that are fixed in the slot of the sensor back plate. This will allow correct positioning of the floor level sensor. If needed, adjust the height of the arm by loosening the screw in the middle of the sensor.

As shown in Fig. 27, position the arm of the sensor at 25° to the contact tube. When rotating the sensor, a snap can be felt when rotated past 25°.

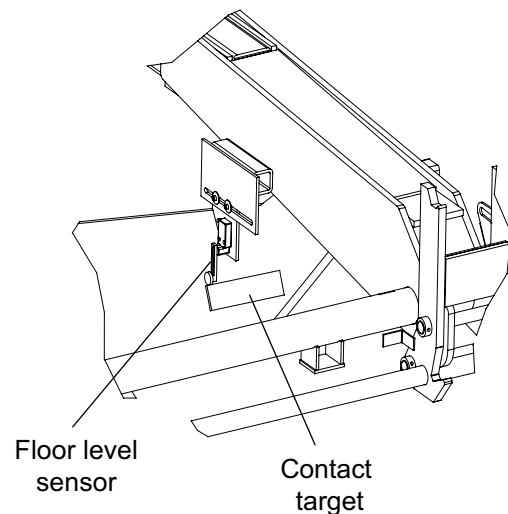
Adjust the sensor arm and sensor to the correct position and retighten.

28. Remove the safety stop blocks from the frame and store the blocks to the side. Lower the dock leveler and lift combo approximately 12" below floor level. Now raise the dock leveler and lift combo. The unit should automatically stop close to floor height. Reposition the floor level sensor if necessary.
29. Raise the dock leveler and lift combo approximately 4" to 6" above floor level. Extend the lock pins using the method described previously. Place a PVC shim bushing over each lock pin. Now place the latch block over each extended lock pin. Orient each latch block as shown in Fig. 28.
30. Lower the platform until it is level with the floor. Remove power (panel off) and slide the latch block to fit snug with the embed pit steel. Make a heavy tack weld to the top and both sides of the latch block, attaching it to the pit steel.

NOTE:

Attach the welder ground cable only to the curb angle, not to the platform scissor arms.

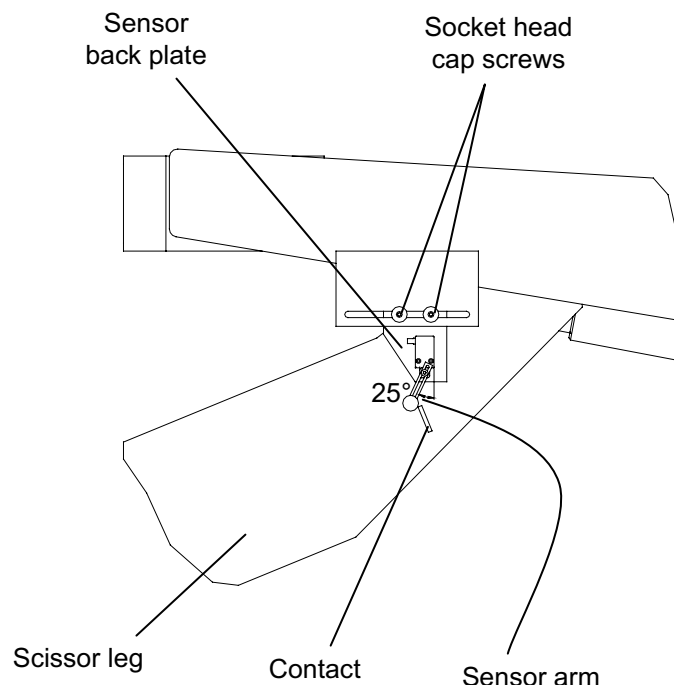
Fig. 26



NOTE:

The floor level sensor assembly is easily accessed if the leveler platform is raised and placed on the maintenance struts. Raising the leveler deck will not affect the floor level adjustment.

Fig. 27



INSTALLATION — PIT MOUNT, continued

31. After the latch blocks have been tack welded, supply power back to the panel. Place the unit in Service Mode and retract the lock pins. Lower the dock leveler and lift combo several feet below floor level and remove the installation shim bushing from each latch block. Now raise the platform to floor level. It will stop automatically. Extend the lock pins. Carefully inspect the lock pin for proper engagement into the latch blocks. If a pin does not engage properly, note the area of interference. If necessary, remove the latch blocks and repeat the block installation procedure.
32. When the blocks have been properly positioned, lower the dock leveler and lift combo and fully weld the latch blocks in place. See Fig. 29 for weld details.

NOTE:

Fine adjustments can be made to floor level sensing using the PLC's potentiometer, see Fig. 14. Using a jewelers screwdriver or equivalent, rotate the potentiometer clockwise to increase or raise the point at which the deck will stop. Rotate the potentiometer counter-clockwise to decrease or lower the point at which the deck will stop. This affects the automatic stop feature when raising the deck while in LIFT mode.

33. The dock leveler and lift combo has two principal operating modes, "LIFT" and "LEVELER". Note panel indications for mode status.
34. If the unit is not already in LIFT Mode, press the LIFT Mode pushbutton indicator. This will initiate a transition which will place the dock leveler and lift combo into the valid LIFT Mode. When sequencing is complete, verify indications represent a valid LIFT Mode configuration, the Lift pushbutton should be solidly lit. Place the light communications switch to the ENTER VEHICLE position and verify the lip operates normally.
35. Place the light communications switch to the DO NOT ENTER VEHICLE position and press the LEVELER pushbutton indicator. The dock leveler and lift combo unit will fall approximately 4" and then raise to finished floor, ensuring a dock level condition. The deck will then rotate upward, the rear lock pins will extend as the lip keepers rotate into place. The deck will then fall until the lip is resting in the lip keepers, and the leveler motor will stop. When sequencing is complete, verify indications represent a valid LEVELER Mode configuration. The indicator light should be solidly lit. If a failure occurs and diagnostics are being reported, refer to the Diagnostics section for details and correct the problem as required. Place the light communications switch to the ENTER VEHICLE position and verify the leveler operated normally.

Fig. 28

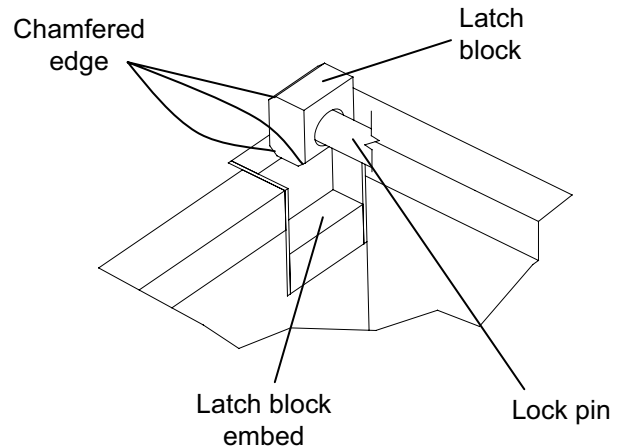
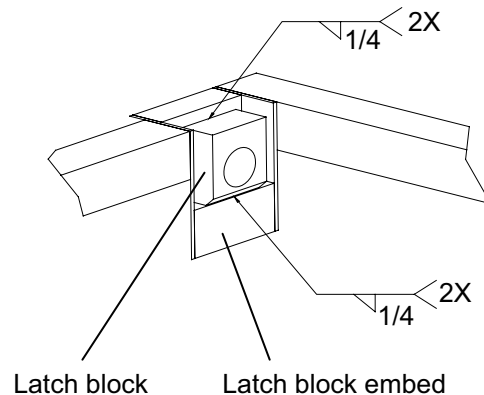


Fig. 29



INSTALLATION — PIT MOUNT, continued

NOTE:

Again, cycle between modes, LIFT Mode then again to LEVELER Mode to ensure all sequencing is correctly performed. If at any time an error occurs or the sequencing does not finish, consult the troubleshooting section of this manual.

36. The front curtain can be installed only when the unit is in LEVELER Mode. Raise the leveler and put the maintenance struts in place.

Thread the curtain brackets over the rod of the curtain on each end. Lower the assembly to attach the curtain brackets to the scissor frame mounting location with the provided bolts as shown in Fig. 30. Ensure the rod of the curtain assembly extends through the brackets on each end.

37. Pretension the curtain assembly. Rotate the curtain assembly 5 revolutions, as shown in Fig. 31.

38. Install the rod and the hanger brackets through the curtain fabric. Install the hanger brackets as shown in Fig. 32. Ensure the hanger brackets are installed over the

39. Press the LIFT pushbutton indicator and operate the dock leveler and lift combo throughout the entire range to check for proper operation of the curtain.

40. Raise the dock leveler and lift combo to dock height and store the unit in Leveler mode.

Fig. 30

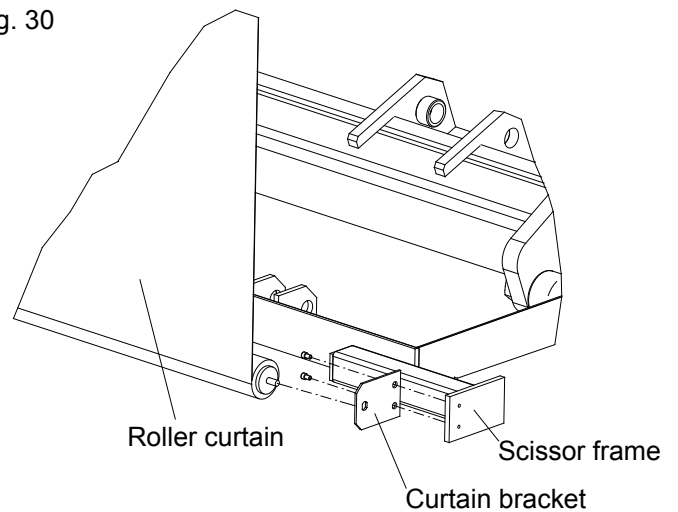


Fig. 31

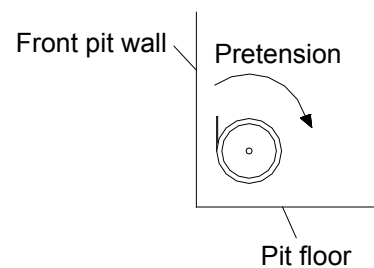
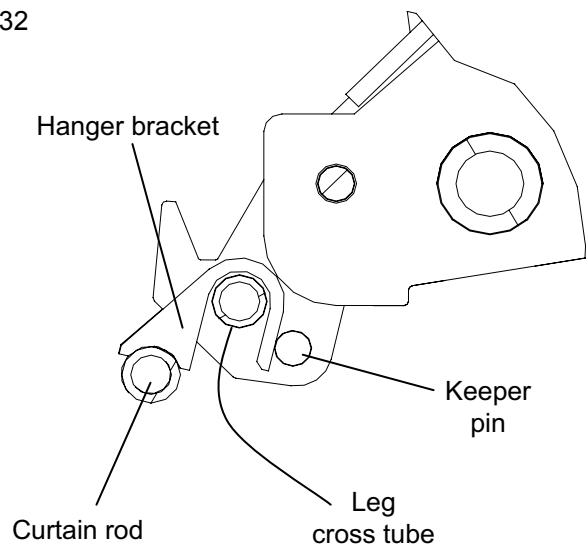


Fig. 32



SERVICE TOOLS

⚠ DANGER

Before servicing the dock leveler and lift combo, read and follow the Safety Practices on page 3-4 and the Operation section of this manual.

Be certain, before entering the dock leveler and lift combo pit or doing any maintenance or repair under the dock leveler and lift combo that:

- 1) The safety blocks are in place on the scissor frame.*
- 2) The both maintenance struts are securely supporting the leveler portion.*
- 3) The power is disconnected and properly tagged or locked out.*

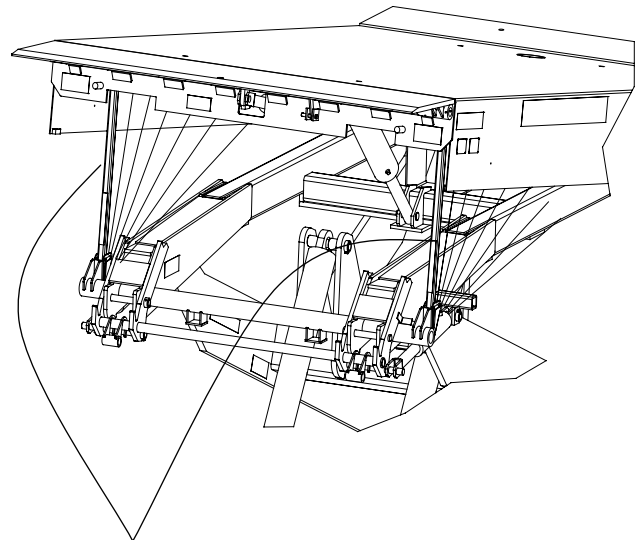
MAINTENANCE STRUTS AND LIP MAINTENANCE BAR

1. To raise the maintenance struts, two people are needed:
 - a. Ensure the dock leveler and lift combo is in Leveler Mode with lock pins engaged. Follow the Operation section of this manual to achieve this position.
 - b. Press and hold the RAISE button on the leveler side of the control panel so the leveler is fully raised.
 - c. Use the second person to raise two maintenance struts to the vertical position.
 - d. Release the RAISE button.
2. If the lip is extended, or you need it extended, and the leveler is on the maintenance struts:
 - a. Push and hold the LIP EXTEND pushbutton.
 - b. Rotate the lip maintenance bar up to the lock position.
 - c. Release the lip and ensure the lip is supported by the lip maintenance bar.
3. Before lowering the maintenance struts, disengage the lip maintenance bar:
 - a. Push and hold the LIP EXTEND pushbutton and rotate the lip maintenance bar down to release.
 - b. Carefully lower the lip.

NOTE:

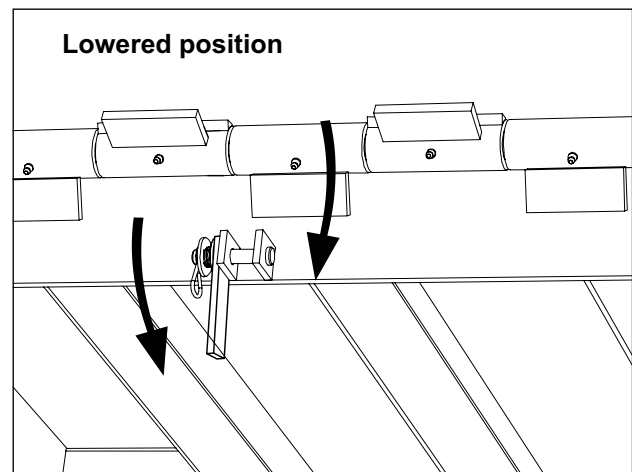
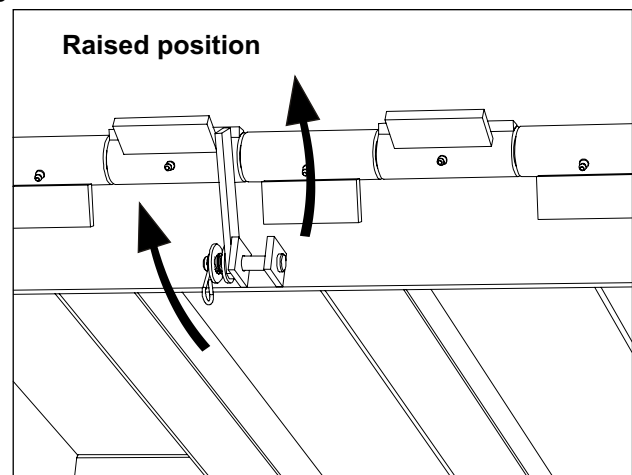
Avoid pressing the RAISE pushbutton with the lip maintenance bar in the raised position, as this can damage the maintenance bar.

Fig. 33



Maintenance struts

Fig. 34



SERVICE TOOLS, continued

4. To disengage the maintenance struts from its locked upright position, two people are needed:
 - a) Push and hold the RAISE button on the control panel.
 - b) Second person shall lift each maintenance strut up from its locked position.
 - c) Rotate the maintenance struts toward the rear of the unit to lower them.
 - d) Release the RAISE button.

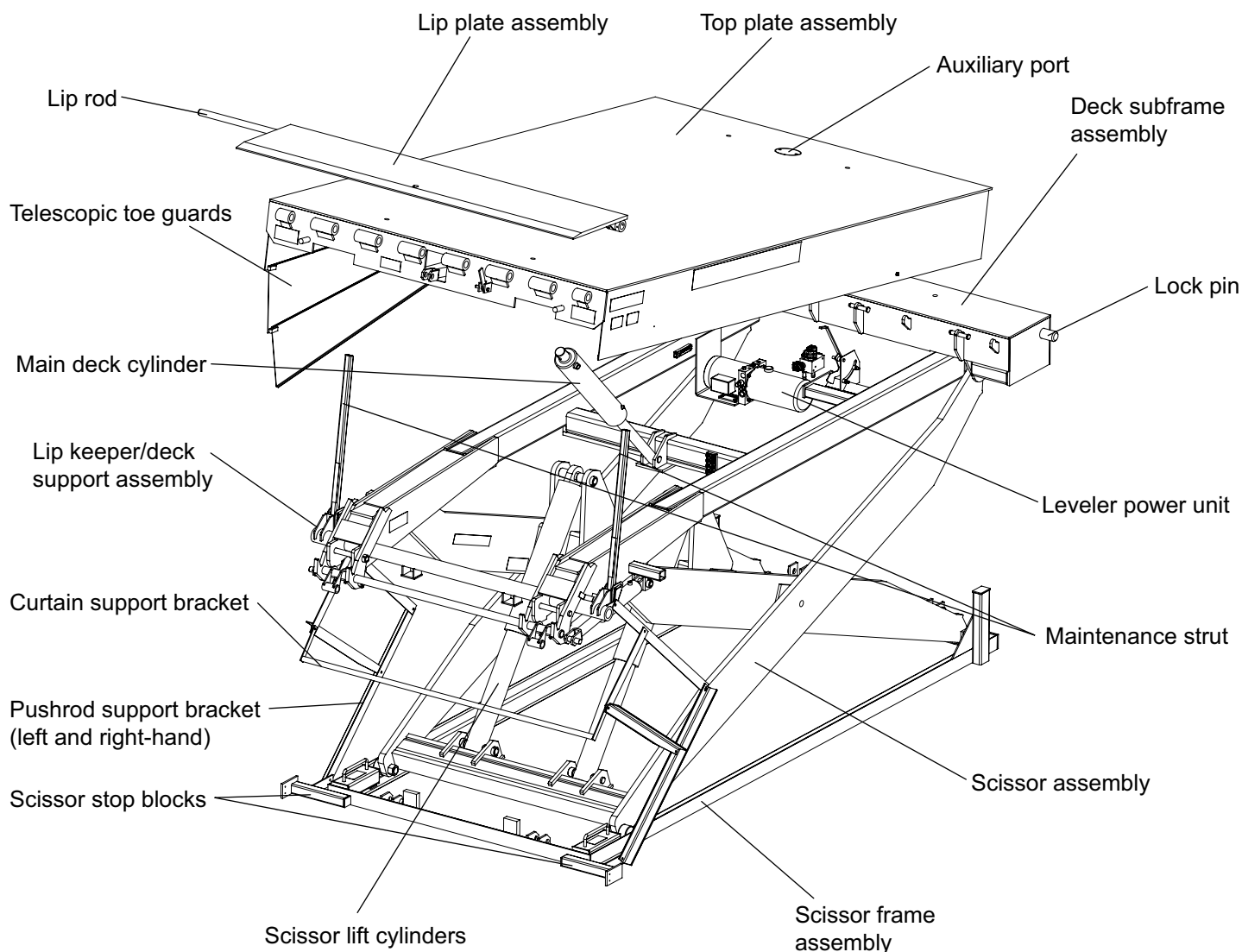
▲ DANGER

It is important to always engage the lip maintenance bar mechanism whenever working under the leveler with the lip extended. Any upward force on the lip could release the lip latch bar allowing the lip to fall.

COMPONENTS AND SPECIFICATIONS

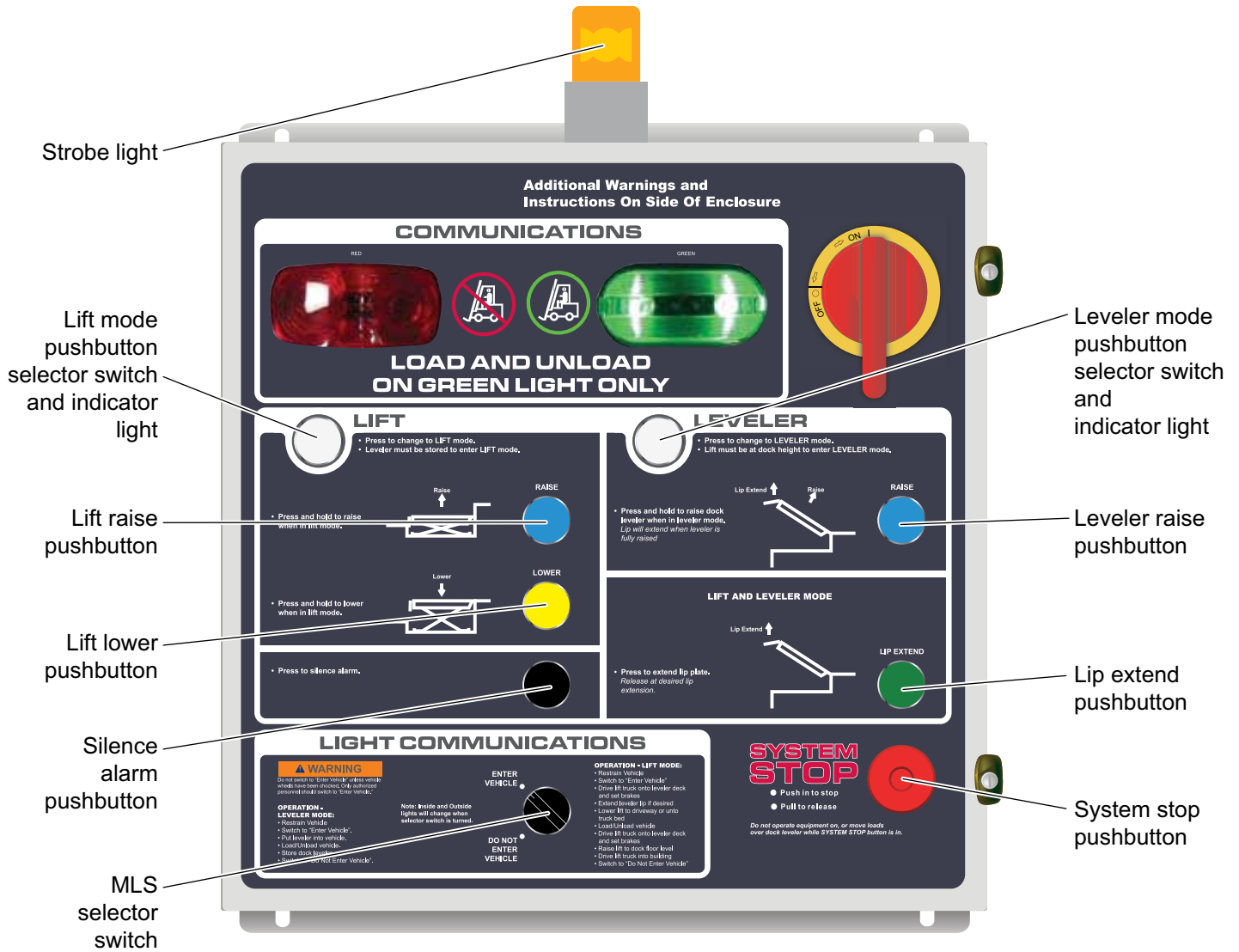
The main components of the dock leveler and lift combo are shown below. See the parts list for specific part numbers.

Fig. 35



COMPONENTS AND SPECIFICATIONS, continued

Fig. 36



COMPONENTS AND SPECIFICATIONS

Control Panel – NEMA 12, automatic motor starter, thermal overload, 2 amp resettable control circuit breaker. C.S.A. and/or U.L. approved.

Lift Motor – NEMA standard T.E.N.V. frame, 7.5 h.p., three phase.

Lift Pump – Fixed displacement gear pump, 5 gpm, primary relief valve set at factory.

Lift Reservoir Capacity – 10 U.S. gallons (lit.) level measured by sight gauge.

Leveler Motor – NEMA standard T.E.N.V. / 56C frame, 1 h.p., three phase.

Leveler Pump – Fixed displacement gear pump, 1 gpm, primary relief valve set at 2000 psi.

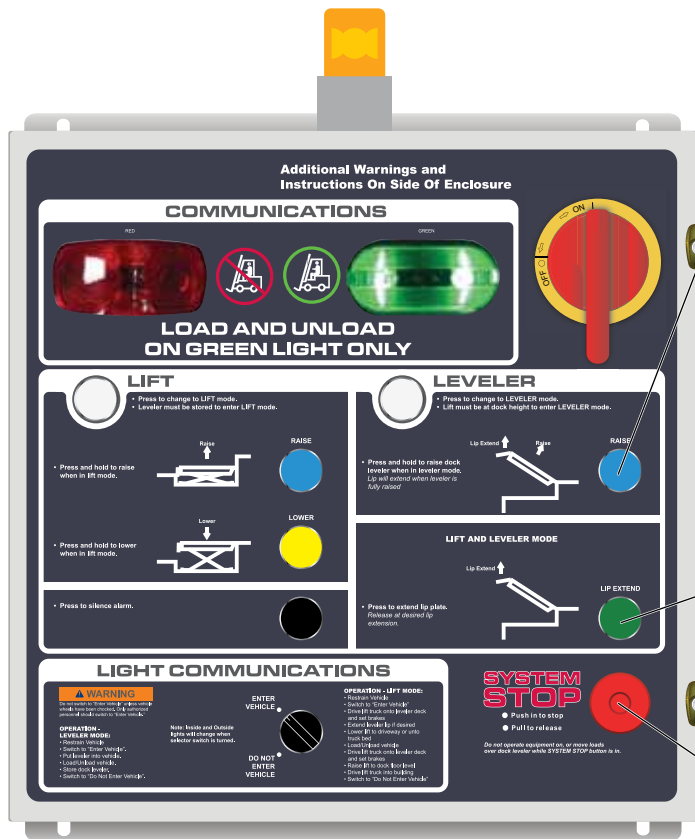
Leveler Reservoir Capacity – 1 U.S. gallons (3.8 lit.) level measured by dipstick.

Hydraulic Fluid – An all weather hydraulic fluid with a viscosity of 15 CSt at 40°C (100°F), such as:

Shell Tellus T 15
Mobil Aero HFA (49011)
Exxon Unavis: HV13, N15, J13
Texaco Aircraft Oil #1554
U.S. Oil Co., Inc. # ZFI-5606 (low temp.)

HYDRAULIC SYSTEM OPERATION — LEVELER

Fig. 37



Leveler Mode

(white leveler indicator light is on)

Raise

- Pump starts and shuttle valve shifts
- Main lift cylinder extends and lip cylinder retracts
- Pilot check valve opens

Fully raised

- Pressure increases
- Sequence valve shifts
- Lip cylinder extends

Stop raise

- Sequence valve and shuttle valve return
- Top plate floats down forcing fluid to reservoir
- Speed controlled by flow control in shuttle valve

Lip extend

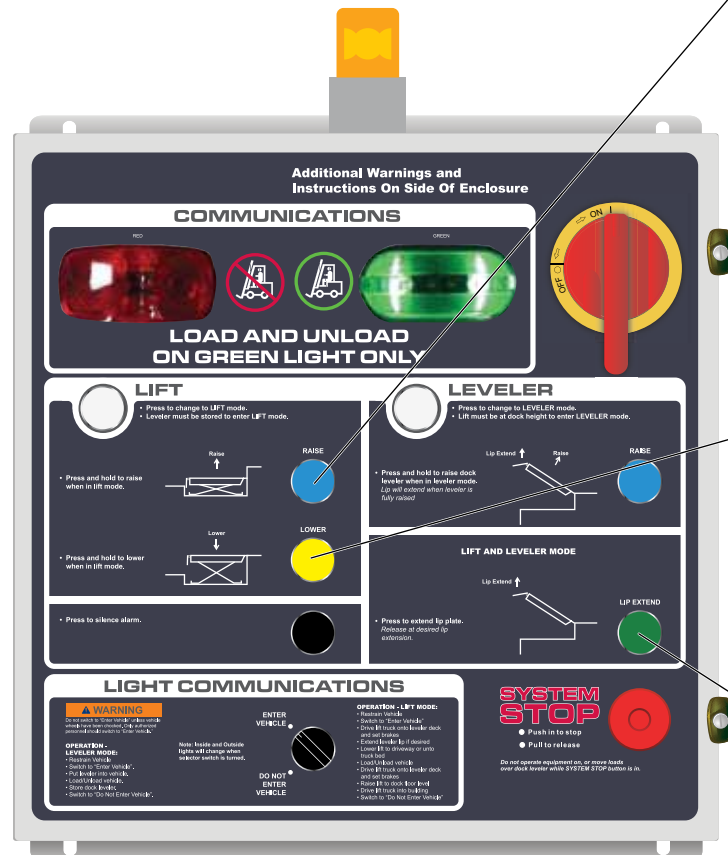
- With leveler above dock height, pump starts as above
- Solenoid valve shifts locking main cylinder in partial raised position
- Pressure increases, sequence valve shifts and lip extends

Stop

- Solenoid valve shifts, locking main cylinder and lip cylinder
- Power cut off from motor control circuit

HYDRAULIC SYSTEM OPERATION — LIFT

Fig. 38



Lift Mode

(white leveler indicator light is on)

Raise

- Pump starts and solenoid shifts allowing lift to rise

Raising from below dock

- Lift will continue to rise while holding the RAISE button until reaching dock height.
- At dock height, the solenoid valve will shift
- The unit will then stop.

Raising from dock height (Service Mode only)

- Lift will rise approximately 4" to 6" while holding the RAISE button.
- Hydraulic lift cylinders will reach the maximum stroke and unit will stop.

Lower

- Solenoid shifts allowing lift to lower.
- Hydraulic fluid is displaced from the lift cylinders to the reservoir as the unit has a controlled descent.
- Lift will continue to lower while holding the LOWER button until reaching grade level.
- Release of the LOWER button at any point of travel shifts the solenoid and stops the unit.

Lip extend

- Solenoid valve shifts allowing the lip to extend
- Lip will stay extended while the lift LOWER button is pressed

STOP

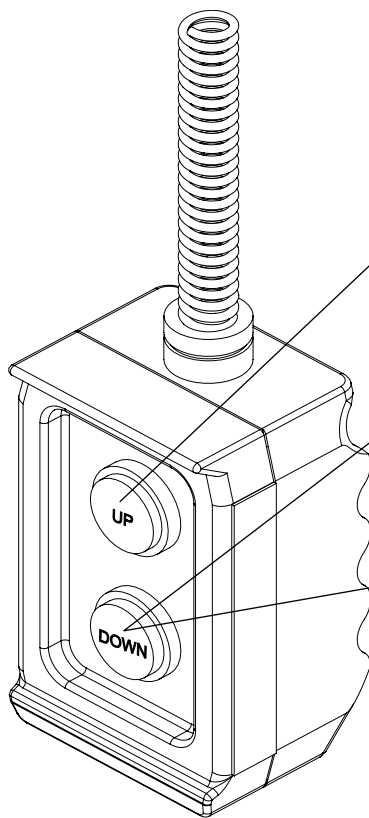
- Solenoid valve shifts, locking main cylinder and lip cylinder
- Power cut off from motor control circuit

NOTE:

Strobe light will flash when the unit is away from dock level. Alarm will sound if the unit is below dock for more than ten minutes. Press the silence alarm button to silence alarm if desired.

HYDRAULIC SYSTEM OPERATION — PENDANT

Fig. 39



UP

- Raise solenoid shifts and lift motor starts allowing the lift to rise.
- Lift will continue to rise while holding the UP button until reaching dock height or the UP button is released
- At dock height, the raise solenoid valve will shift.
- The unit will then stop

DOWN

- Lower solenoid shifts allowing lift to lower
- Hydraulic fluid is displaced from the lift cylinders to the reservoir as the unit has a controlled descent.
- Lift will continue to lower while holding the LOWER button until reaching grade level.
- Release of the LOWER button at any point of travel shifts the solenoid and stops the unit.

LIP EXTEND ON LOWER

- Rapidly press the DOWN button twice and hold.
- The lip solenoid valve shifts allowing the lip to fully extend.
- The unit will then lower while the lip stays extended.
- Release of the LOWER button at any point of travel shifts the solenoid and stops the unit. The lip solenoid shifts and the lip rotates to the pendant position.
- Label 6009318 is located on the side of the pendant. This label explains operation of the lip extend on lower function.

NOTE:

The pendant duplicates the LIFT, RAISE and LOWER functions.

OPERATION

⚠ WARNING

Before operating the dock leveler and lift combo, read and follow the Safety Practices on pages 3-4.

Use of dock leveler restricted to trained operators.

Follow procedures on placard posted near dock leveler.

DO NOT USE THE DOCK LEVELER IF IT LOOKS BROKEN, OR DOES NOT SEEM TO WORK RIGHT. Tell your supervisor it needs repair right away, or contact your local Serco distributor.

Before pressing button, ensure lip avoids contact with vehicle platform sides and cargo. If lip does not lower to vehicle platform, reposition vehicle platform.

Stay clear of leveler unless lip is supported by vehicle platform or the leveler is stored at dock level. Visually check that the lip is supported by the vehicle platform or the ramp is supported by both lip keepers or safety legs before driving or walking on the ramp. Unsupported dock levelers can lower unexpectedly.

Before chocking wheels or engaging vehicle restraint, dump air from air ride suspensions and set parking brakes.

Always be certain that the vehicle wheels are chocked, or that the vehicle is locked in place by a vehicle restraining device and the brakes are set before loading or unloading. Vehicles pulling away from the dock unexpectedly can cause uncontrolled drop of the dock leveler which can result in death or serious injury.

Visually check that the lip is supported by the vehicle platform or the ramp is supported by both front lip keepers or deck support leg before driving or walking on the ramp.

The maximum uncontrolled drop of a dock leveler under load is 4" from the vehicle platform height from which the dock leveler was positioned.

Always return the dock leveler to its dock level (stored) position before allowing the vehicle to leave the dock. If the vehicle pulls away from the dock before the dock leveler is stored, the lip will fall to its pendant position and the ramp will drop. In addition, failure to properly store the leveler may leave the leveler in a position below the level of the dock floor. This condition may result in unexpected drop of personnel or material handling equipment and result in death or serious injury.

Failure to follow these instructions could result in death or serious injury to operators and/or bystanders.

INTRODUCTION

The dock leveler and lift combo is a combination dock leveler and lift table. It has been assembled as a self-contained unit which requires installation in a pit and electrical connection to the control panel.

The dock leveler portion is designed to span and compensate for the space and height differences between a loading dock and freight carrier to allow safe, efficient freight transfers.

The dock leveler uses a pushbutton control to position the ramp. Pushing and holding the leveler RAISE button operates a hydraulic cylinder to raise the ramp. Releasing the leveler RAISE button allows the ramp to lower.

When the dock leveler reaches its full raised position, a second hydraulic cylinder extends the lip. The dock leveler with its lip extended settles onto the vehicle platform forming a bridge.

After loading, pressing and holding the leveler RAISE button allows the ramp to rise. The lip will retract as the leveler is raised. Releasing the leveler RAISE button lowers the ramp into its level, stored position.

For below dock end loading, press the leveler RAISE pushbutton until the leveler is about 6" above dock. Press the lip extend pushbutton until the lip extends 2-3", clearing the lip keepers. Release the lip extend pushbutton and the leveler will float down for end loading.

The lift table portion is designed to lower or raise a load up to the rated lifting capacity between dock and grade level.

The lift table uses pushbuttons to control the position of the lift. Pushing and holding the lift RAISE button operates two hydraulic cylinders to raise the lift. The lift will continue to rise while holding the lift RAISE button until the unit reaches dock level and will stop. Pushing and holding the lift LOWER button will displace the hydraulic fluid from the cylinders and allow the lift to lower. The lift will continue to lower while holding the lift LOWER button until the unit reaches grade level. Releasing the button while raising or lowering the lift will stop the unit at that height.

In Leveler Mode, the dock leveler is in its stored position at dock height with the lock pins engaged and the ramp being supported by both lip keepers.

In Lift Mode, the lift is in its stored position with the lock pins retracted and the ramp being supported by the deck support legs on the lip end.

OPERATING INSTRUCTIONS — LEVELER MODE

⚠ WARNING

Always secure the vehicle with a vehicle restraint or wheel chocks before operating the dock leveler.

Do not operate the dock leveler and lift combo with anyone standing on or in front of the unit.

Do not drive on the lip until it is fully extended and supported by the vehicle bed or by the drive surface at grade level.

Do not drive on the leveler when the STOP button is pressed in.

Always keep hands and feet clear of all moving parts.

Always restore the dock leveler and lift combo to its safe dock level position after servicing the vehicle.

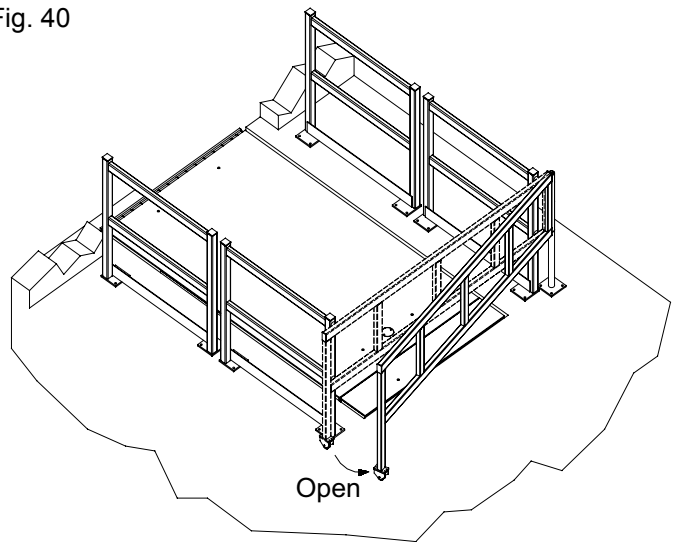
RAISING LEVELER

Ensure a vehicle restraining device is engaged or wheel chocks in place before operating the dock leveler.

Ensure the dock leveler and lift combo is in Leveler Mode. When the unit is in Leveler Mode the Leveler Mode lighted pushbutton will be lit. Verify the lock pins are engaged and lip is supported by both lip keepers. If the unit is not in Leveler Mode, rotate the Light Communications (MLS) switch to DO NOT ENTER TRUCK and press the LEVELER pushbutton. The unit will lower approximately 8" and then rise back to dock level. This step ensures that the unit is at dock level. After this step the leveler will rise, then the lock pins engage and the lip keepers will rotate into place.

1. Remove the rear chains, swing gate or any other device blocking traffic access to the dock leveler and lift combo. See Fig. 40.
2. Rotate the MLS switch to ENTER VEHICLE. This will change the inside light to green and the outside light to flashing red.

Fig. 40



OPERATING INSTRUCTIONS — LEVELER MODE, continued

3. Press the RAISE button on the control panel to raise leveler. See Fig. 41.
4. Continue to press the RAISE button. The lip will automatically extend when the leveler is fully raised.

NOTE:

To extend the lip earlier, press and hold the lip extend pushbutton. The deck will hold in position and the lip will extend fully.

⚠ WARNING

Do not drive on dock leveler or lip until it is fully extended and supported by the vehicle bed.

Never use a fork truck or other material handling equipment to lower the ramp and lip section.

5. When lip is fully extended release the button. The leveler will slowly float down to the vehicle bed. See Fig. 43.

NOTE:

If an obstruction prevents the lip from deploying properly, press and hold the leveler RAISE button to raise and retract the lip. Restore the leveler to safe dock level position with the lip in both lip keepers for end loading.

Fig. 41

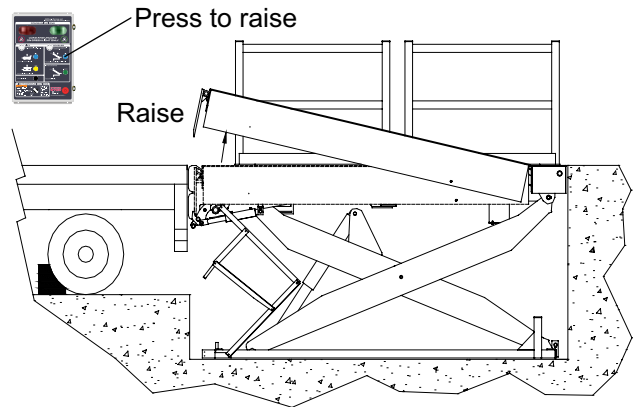


Fig. 42

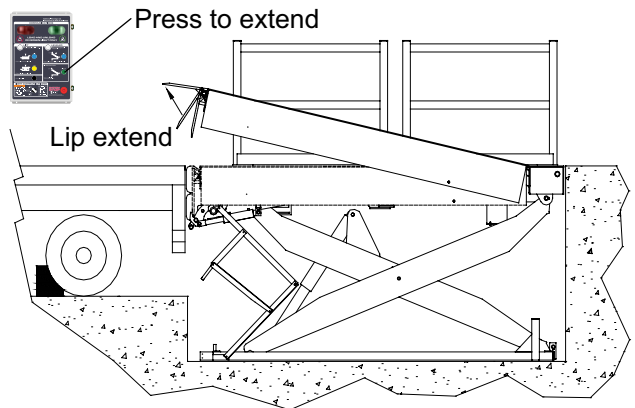
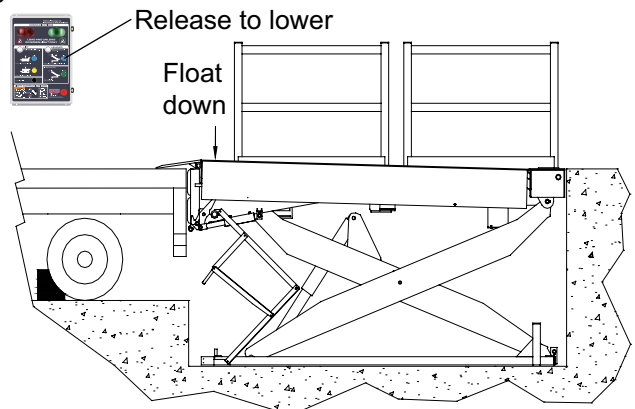


Fig. 43



OPERATING INSTRUCTIONS — LEVELER MODE, continued

STORING LEVELER

1. To return the leveler to the stored position, press and hold the leveler RAISE button. As the leveler rises the lip will retract. When the lip is fully retracted, release the button. The leveler will float down to the stored position with the lip supported by both lip keepers.

▲ WARNING

Before allowing vehicle to leave, always return the dock leveler to its dock level (stored) position with the lip supported by both lip keepers and ensure no equipment, material or people are on the dock leveler. See Fig. 44. Failure to do so may leave the dock leveler in a position below the level of the dock floor. This condition may result in unexpected drop of personnel or material handling equipment and could result in death or serious injury.

2. Reapply the rear chains or close the swing gate or any other device blocking traffic access. See Fig. 46.
3. After the dock leveler is stored, rotate the MLS switch to DO NOT SERVICE VEHICLE. This will change the inside light to red and the outside light to flashing green.

BELOW DOCK END LOADING

1. Press and hold the leveler RAISE button until the leveler is fully raised and the lip starts to extend. When the lip has extended 2 to 3" to clear the front of the keepers, release the button. Leveler will float down for end loading, See Fig. 45. Make sure END LOADING is done with the MLS switch in the ENTER VEHICLE position.

Fig. 44

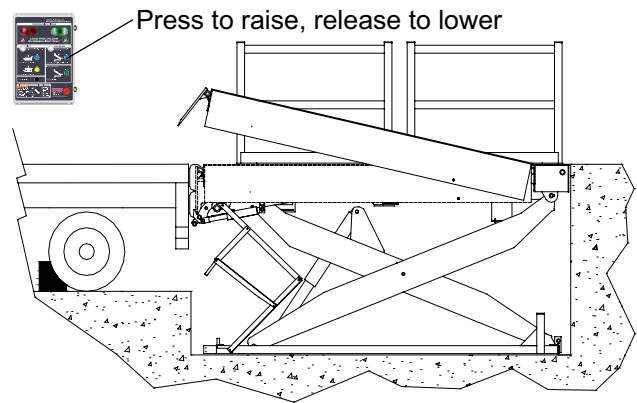
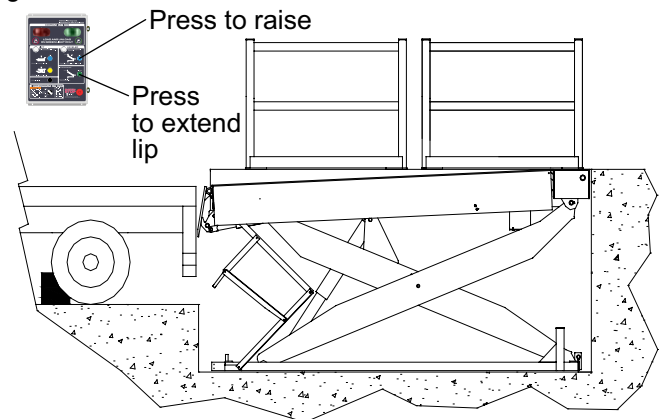


Fig. 45



OPERATING INSTRUCTIONS — LIFT MODE

⚠ WARNING

Always secure the vehicle with a vehicle restraint or wheel chocks before operating the dock leveler.

Do not operate the dock leveler and lift combo with anyone standing on or in front of the unit.

Do not drive on the lip until it is fully extended and supported by the vehicle bed or by the drive surface at grade level.

Always keep hands and feet clear of all moving parts.

Always restore the dock leveler and lift combo to its safe dock level position after servicing the vehicle.

NOTE:

Strobe light will flash when the unit is away from dock level. The strobe light will stop flashing when the unit returns to dock level. An alarm will sound if the unit stays below dock level for more than ten minutes. Return the unit to dock level or press the silence alarm button to silence alarm if desired.

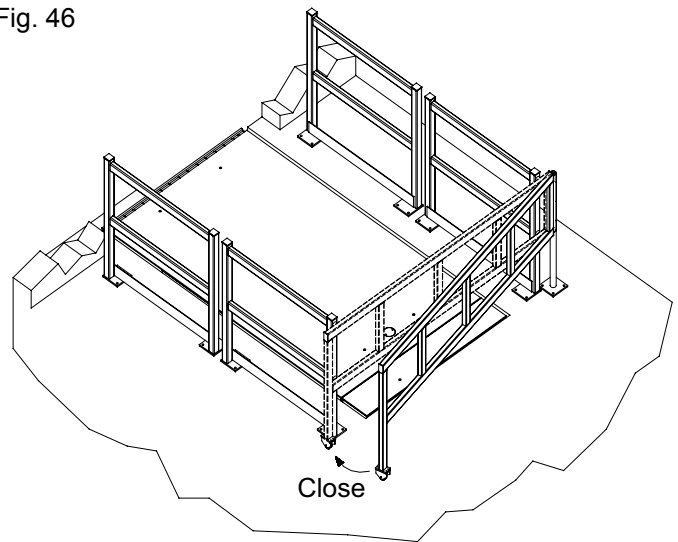
LOWERING LIFT

Before operating the lift onto a truck bed, ensure a vehicle restraining device is engaged or wheel chocks in place. Before lowering the lift onto the driveway, ensure that there are no obstructions impeding the downward travel of the lift.

Ensure the dock leveler and lift combo is in Lift Mode. Verify the lock pins are retracted and deck is supported by both deck support legs. When the unit is in Lift Mode the Lift Mode lighted pushbutton will be lit. If the unit is not in Lift Mode, rotate the Light Communication (MLS) switch to DO NOT ENTER TRUCK and press the LIFT pushbutton. The leveler will rise, then the lock pins disengage and the deck support legs will rotate into place.

1. Remove the rear chains, swing gate or any other device blocking traffic access to the dock leveler and lift combo. See Fig. 40.
2. Rotate the MLS switch to ENTER VEHICLE. This should change the inside light to green and the outside light to flashing red.
3. Drive lift truck onto leveler deck and set brakes.
4. After the load is on the lift platform, reapply the rear chains or close the swing gate or any other device blocking traffic access. See Fig. 46.

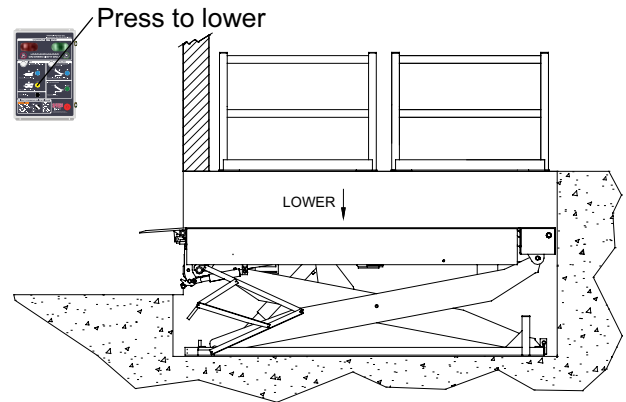
Fig. 46



OPERATING INSTRUCTIONS — LIFT MODE, continued

5. Fully extend the leveler lip by pressing and holding the lip extend pushbutton.
6. Press and hold the lift LOWER button to lower the lift to a position where the leveler lip is supported either by the driveway surface or by a vehicle bed. See Fig. 47.

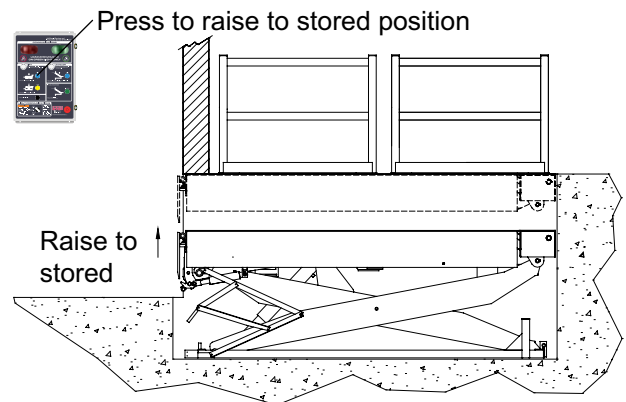
Fig. 47



RAISING LIFT

1. Press and hold the lift RAISE button to raise the lift from a lowered position. The unit will continue to rise while holding the RAISE button until the unit reaches dock level, the unit will then stop. See Fig. 48 and 49.
2. Remove the rear chains, swing gate or any other device blocking traffic access to the dock leveler and lift combo. See Fig. 40.
3. Drive the lift truck into the building and completely remove the load from the dock leveler and lift combo.

Fig. 48

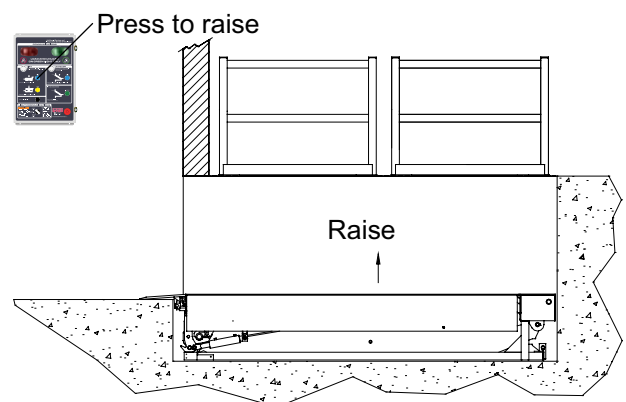


⚠ WARNING

Before allowing vehicle to leave, always return the dock leveler and lift combo to its dock level (stored) position at dock height with the lip stored in both lip keepers and ensure no equipment, material or people are on the dock leveler. Failure to do so may leave the dock leveler in a position below the level of the dock floor. This condition may result in unexpected drop of personnel or material handling equipment and could result in death or serious injury.

4. Reapply the rear chains or close the swing gate or any other device blocking traffic access. See Fig. 46.
5. With the dock leveler and lift combo at dock level, rotate the MLS switch to DO NOT ENTER VEHICLE. This will change the inside light to red and the outside light to flashing green.
6. If desired, press the LEVELER mode pushbutton and store the unit in Leveler Mode. When the unit is in Leveler Mode the Leveler Mode lighted pushbutton will be lit.

Fig. 49

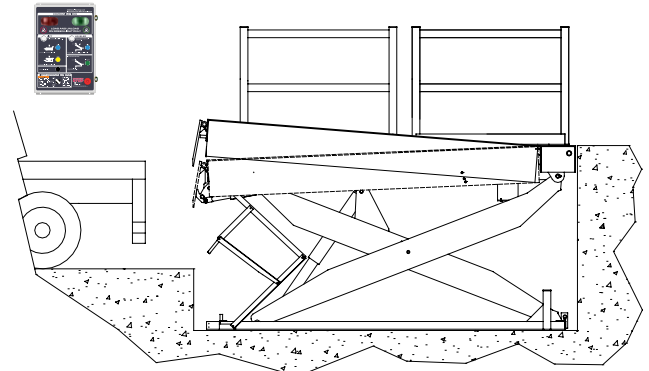


OPERATING INSTRUCTIONS — AUTO RETURN TO DOCK A.R.T.D.

The A.R.T.D. automatically resets the leveler whenever a vehicle pulls away from the loading dock with the lip resting on the vehicle. This function performs in this manner:

1. If the vehicle pulls away, the leveler will float down to the lowest position and the lip will fall. When the light communication switch is in the DO NOT SERVICE VEHICLE position the leveler will automatically raise, retract the lip, and then float down to the stored position. See Fig. 50.

Fig. 50



PLANNED MAINTENANCE

To ensure proper operation of your dock leveler and lift combo, perform the following planned maintenance procedures.

▲ DANGER

Be certain, before entering the dock leveler and lift combo pit or doing any maintenance or repair under the dock leveler and lift combo that:

- 1) The safety blocks are in place on the scissor frame.***
- 2) The maintenance struts are securely supporting the leveler portion.***
- 3) The power is disconnected and properly tagged or locked out.***

▲ WARNING

Before servicing the dock leveler and lift combo, read and follow the Safety Practices on pages 3-4 and the Operation section of this manual.

Place barricades on the dock floor around the dock leveler and lift combo pit and in the driveway in front of the pit while installing, maintaining or repairing the unit.

WEEKLY

1. Clean the upper portion of the lip plate hinge with a brush and blow away all dirt and debris.
2. Inspect for debris in rear hinge area of the dock leveler and lift combo. Also check for debris between the unit and the side pit walls to ensure smooth operation. Clean as required.
3. Check the full operation of the dock leveler and lift combo to ensure there is no hesitation in the hydraulic system. Any loss of fluid will affect the safety valve operation.
4. Inspect the operation of the telescopic toe guards to ensure they are not distorted or binding when the leveler is operating.
5. Clean the area that accesses the drain located at the bottom of the pit to remove any build up of debris.

QUARTERLY

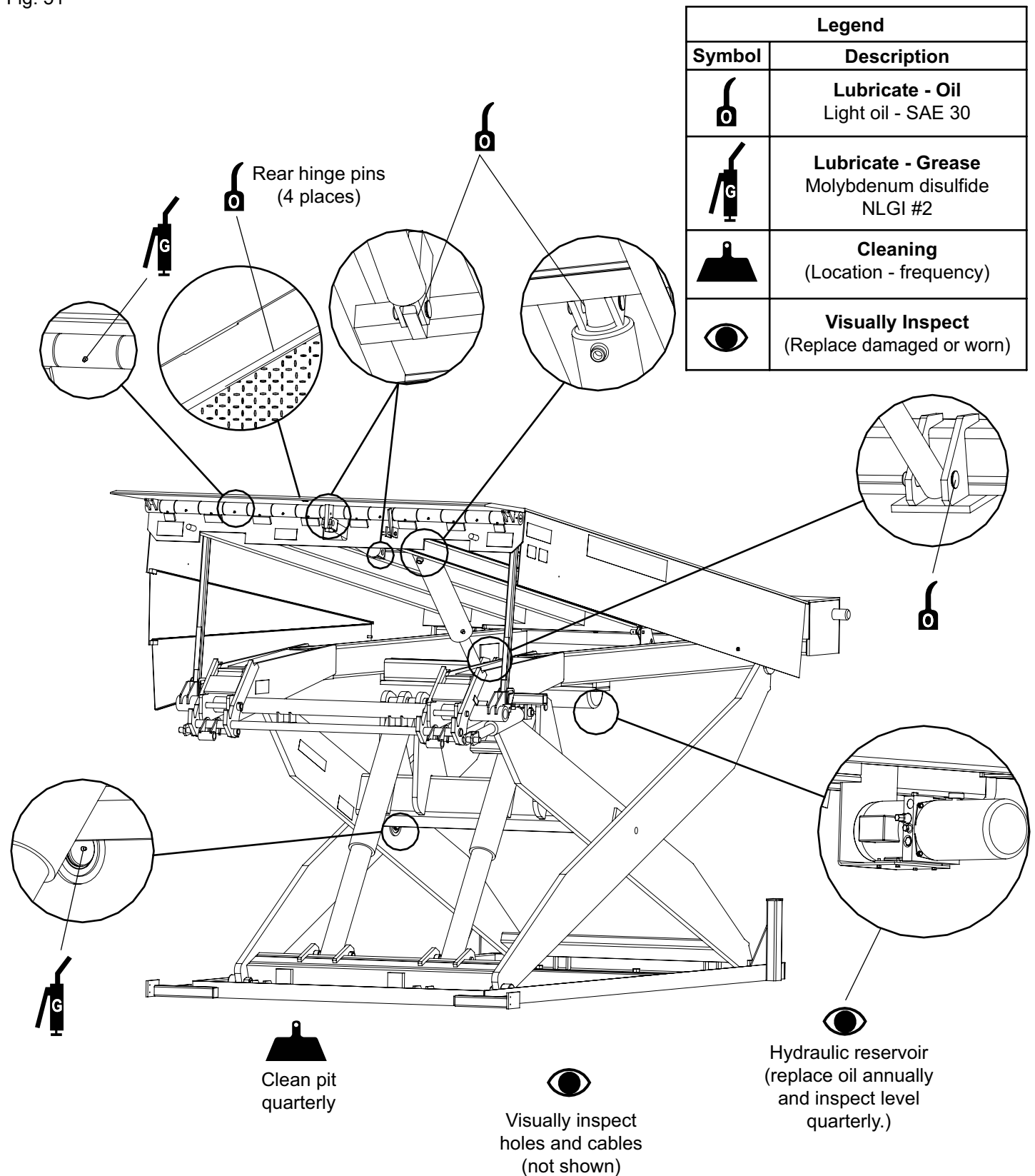
1. Inspect all warning labels and placards. See page 44. Replace as necessary.
2. Clean out the inside of the pit area. Take care not to spray any electrical parts.
3. Inspect and lubricate all mechanical pivot points on the dock leveler and lift combo with S.A.E 30 oil. Cycle the unit when lubricating. See page 44.
4. Inspect the hydraulic cylinders and hoses for any fluid loss. Check the hoses for signs of excessive wear.
5. Inspect the reservoir level of the leveler power unit. Check the reservoir level with the leveler fully extended. Add fluid as required. See page 44.
6. Inspect the reservoir level of the scissor lift power unit. Check the reservoir level with the unit fully extended. Add fluid as required. See page 44.
7. Inspect all welds under the dock leveler and lift combo for fatigue or failure, particularly the lip plate hinge, top plate beams, front hinge bar and the scissor cylinder support weldments.
8. Check the full operation of the dock leveler and lift combo. Make any adjustments as required.
9. Lubricate the lip plate tubes and the main scissor bearings with a Molydenum Disulfide NLGI#2 grease. Do not over grease. For the lip hinge tubes, stop when grease starts to ooze from the hinge tube ends. Wipe off excess grease. See page 44.
10. Inspect dock bumpers. 4" of bumper protection is required. Worn, torn, loose or missing bumpers must be replaced.

Hydraulic Fluid – An all weather hydraulic fluid with a viscosity of 15 CSt at 40°C (100°F), such as:

Shell Tellus T 15
Mobil Aero HFA (49011)
Exxon Unavis: HV13, N15, J13
Texaco Aircraft Oil #1554
U.S. Oil Co., Inc. # ZFI-5606 (Low Temp.)

PLANNED MAINTENANCE, continued

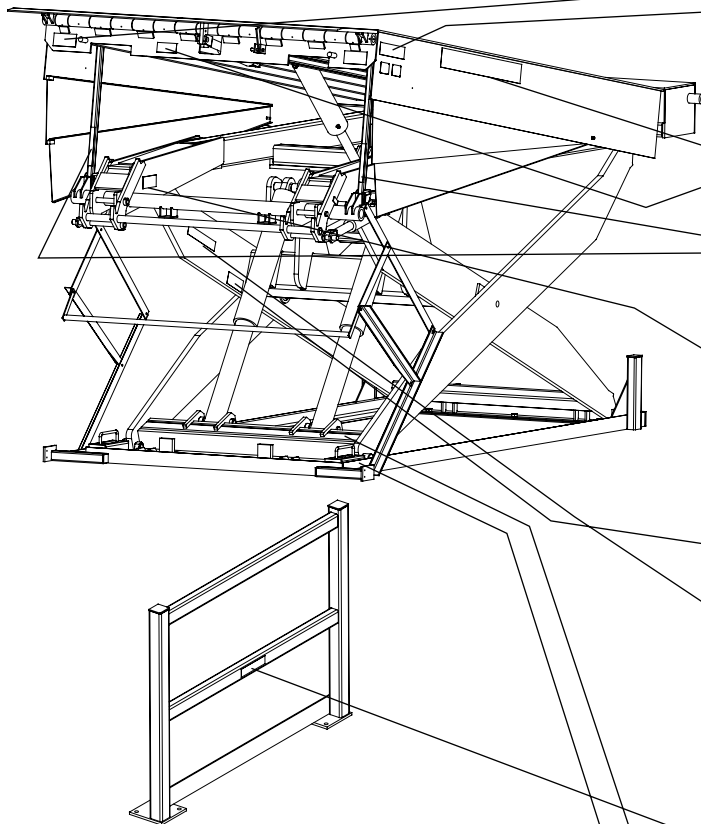
Fig. 51



PLANNED MAINTENANCE, continued

Every 90 days (quarterly) inspect all safety labels and tags to ensure they are on the dock leveler and lift combo and are easily legible. If any are missing or require replacement, please call 1-800-525-2010 or 972-466-0707 for replacements.

Fig. 52



921-050	208 VOLTS
921-052	240 VOLTS
921-053	480 VOLTS
921-147	600 VOLTS
921-027	THREE PHASE

(Located on power unit)

6008834

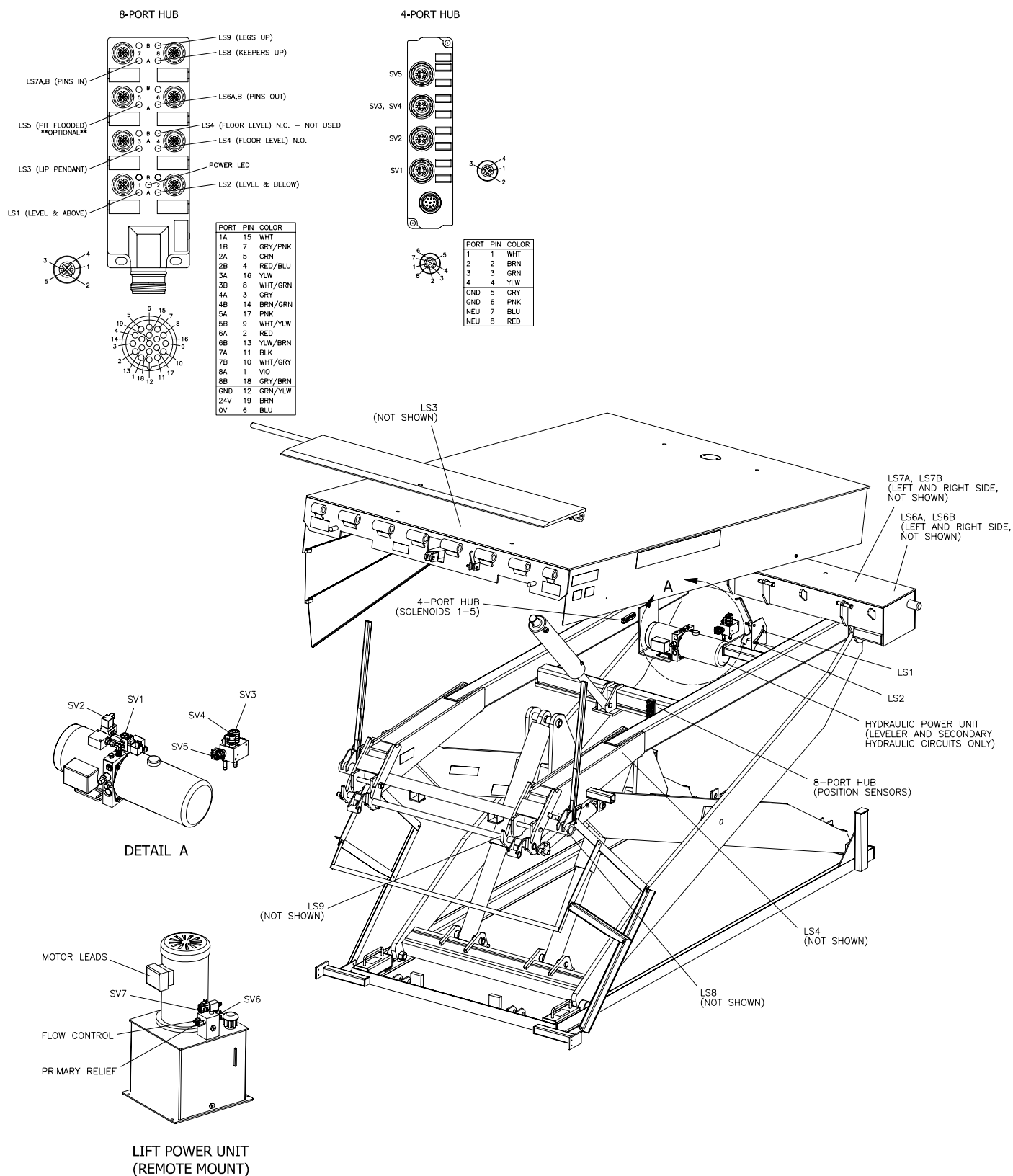
⚠ DANGER	OPERATING INSTRUCTIONS

Warning and operation placard (Mounted on wall near leveler)

921-217 (x2)	⚠ DANGER CRUSH HAZARD Maintenance strut must support leveler behind bar. Do not force maintenance strut forward or bar to support lip. Refer to user's manual for proper use. Failure to do so will result in death or serious injury.
6008485 (x2)	⚠ DANGER SAFETY INSTRUCTIONS OPERATION 1. Read and follow all instructions and warnings in user's manual. 2. Use of dock leveler restricted to trained operators. 3. Always check trailer weight or engine trailer support before opening dock leveler or attempting to load or unload. 4. Never use hands or equipment to move ramp or lips. 5. Before activating dock leveler: • Ensure trailer is locked in against supports. • Check trailer alignment to avoid damage. If it does not, adjust trailer, suspension, wheels. 6. Ensure back end supports (steering bar or bumper frame) supports ramp firmly during or onto. 7. Stay clear of fingers and feet and sides of rising dock leveler. MAINTENANCE/SERVICE 1. Read and follow all instructions, warnings and maintenance schedules in user's manual. 2. Perform maintenance on dock leveler restricted to trained personnel. 3. Place barriers on driveway and dock floor to show service work is being performed. 4. DO NOT ENTER PIT unless dock leveler is securely supported by maintenance strut. 5. Electrically powered turn off and use OSHA lockout/tagout procedures. Call 202-515-1000 for replacement placards, warning labels, or user's manual.
921-075	⚠ WARNING Manual activation of the limit switch will start the motor. Disconnect power before making adjustments. Refer to User's Manual for proper maintenance procedures.
921-074 (x2)	⚠ DANGER CRUSH HAZARD Do not work under dock leveler unless this maintenance strut has been secured in the upright position. See user's manual for proper procedures.
921-070	⚠ DANGER CRUSH HAZARD DO NOT ENTER PIT unless dock leveler is securely supported by the maintenance strut. Place barriers on driveway and dock floor to indicate service work being performed. Failure to comply will result in death or serious injury. Refer to user's manual for proper maintenance procedures.
6007121 (x2)	⚠ DANGER PINCH POINT POINT DE PINCEMENT
6003451 (x2)	⚠ DANGER To avoid bodily injury, read all instructions before operating or servicing lift. Do not put hands or feet under top. Do not work under lift without maintenance device.
6008547 Serco (x2) 6008548 Kelley (x2)	MAXIMUM RATED LIFTING CAPACITY 0,000 lbs ⚠ DANGER Do not exceed ratings. DO NOT EXCEED RATINGS
6008880 (x4)	⚠ WARNING DO NOT USE THIS EQUIPMENT WITHOUT THE GUARDRAILS IN PLACE
921-234 (x2)	MAINT. DEVICE For use only in maintenance of lift. Not to be used to support the lift platform when loaded. See user's manual for proper usage.
6007074(x2)	⚠ DANGER Do not work under lift without maintenance device.
6009318	For lip extend on lower: Press and hold the DOWN button twice and hold.

TROUBLESHOOTING

Fig. 53



TROUBLESHOOTING, continued

Use the Troubleshooting Guide if ever the dock leveler and lift combo fails to perform properly. Find the condition that most closely matches your situation and make the recommended adjustments. Observe all safety warnings before attempting any maintenance procedure.

⚠ WARNING

Before servicing the dock leveler and lift combo, read and follow the Safety Practices on pages 3-4 and the Operation section of this manual.

The PLC will display real time diagnostics using the Lift/Leveler pilot lamps located on the front face of the control panel. Static errors flash both pilot lamps simultaneously indicating a specific failure condition. Dynamic errors flash only one pilot lamp (the lamp associated with the current transition mode) and indicate a logging of the last attempted step in a given transition mode prior to failure. Example: if the error occurs while the Lift acquisition mode was executing, the Lift pilot lamp will flash the trouble code. The number in parentheses represents the number of lamp flashes. These dynamic trouble codes store information that is lost once the motor run time has elapsed.

LIFT pilot lamp flashing lift acquisition timeout (20 seconds)

Flash Count	Problem Category	Possible Cause	Solution
2	Deck Raise	a) Load on Leveler	Press RESET push button
		b) Leveler Power Unit malfunction	
3	Pins In/Legs Up	a) Sensors incorrectly positioned or malfunctioning	Press RESET push button
		b) Leveler Power Unit malfunction	

LEVELER pilot lamp flashing Leveler acquisition timeout (30 seconds)

Flash Count	Problem Condition	Possible Cause	Solution
2	Lift Lower	a) Scissor stop blocks are preventing the unit from lowering	Press RESET push button
		b) Lift Power Unit malfunction	
3	Lift Raise	a) Lift Power Unit malfunction	Press RESET push button
4	Deck Raise	a) Load on Leveler	Press RESET push button
		b) Leveler Power Unit malfunction	
5	Pins Out/Legs Down	a) Pins not aligned with latch blocks	Press RESET push button
		b) Sensors incorrectly positioned or malfunctioning	
		c) Leveler Power Unit malfunction	

TROUBLESHOOTING, continued

⚠ WARNING

Before servicing the dock leveler and lift combo, read and follow the Safety Practices on pages 3-4 and the Operation section of this manual.

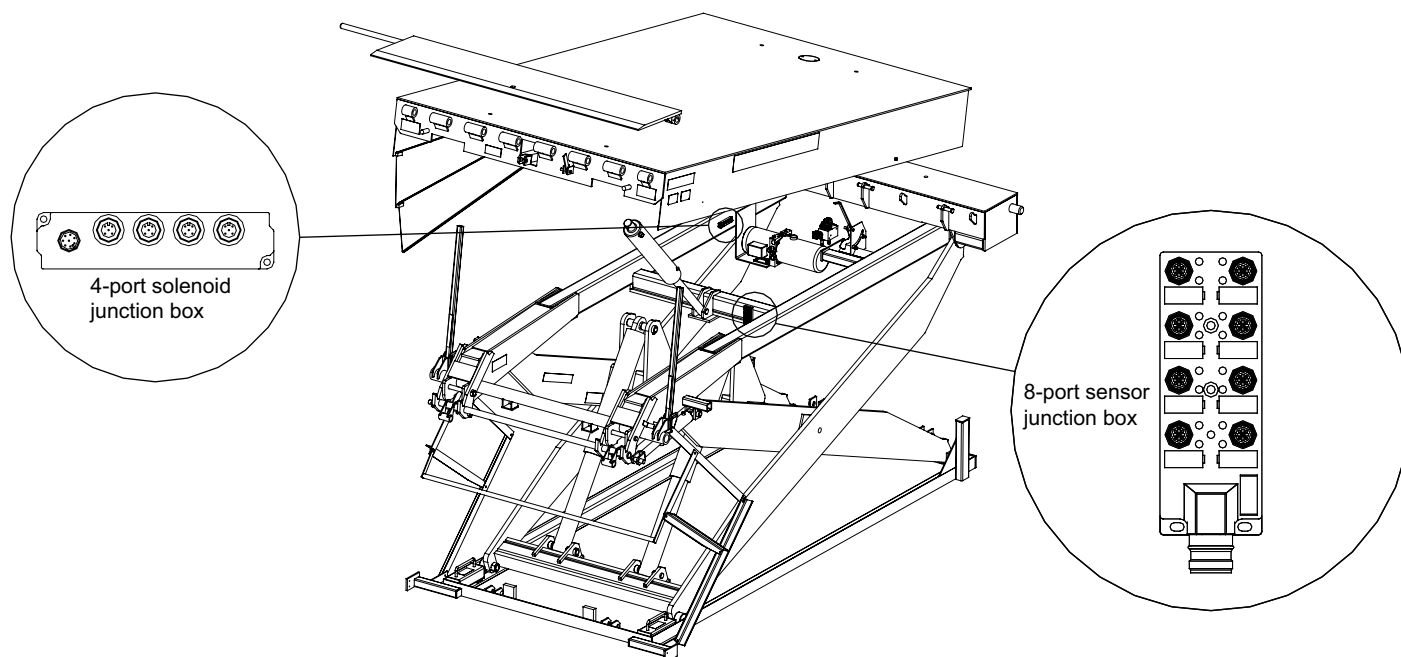
LIFT/LEVELER pilot lamps flashing (both simultaneously)

Flash Count	Problem Condition	Possible Cause	Solution
2	Lock Pin Sensors	Lock Pins Engaged and Disengaged sensors are ON at the same time	investigate cause for sensor malfunction
3	Leg/Keeper Assy	Lip Keepers and Deck Support Leg sensors are ON at the same time	investigate cause for sensor malfunction
4	Deck Level	Deck not level while in LIFT mode unless lowering with lip retracted (> 0 degrees)	check for any interference
5	Flooded	Flood condition, power to motors and solenoid valves is removed	check for flooding in pit
6	Lift motor	Lift motor timeout (1 minute), possible power unit malfunction.	Press RESET push button
7	Leveler motor	Leveler motor timeout (1 minute), possible power unit malfunction.	Press RESET push button

The dock leveler and lift combo is supplied with connectivity products to ease installation and troubleshooting. The 8-port junction box, located where shown below, has signal LED display.

Page 49 and 50 will detail the standard LED display when the unit is stored in LIFT and LEVELER mode.

Fig. 54



TROUBLESHOOTING, continued

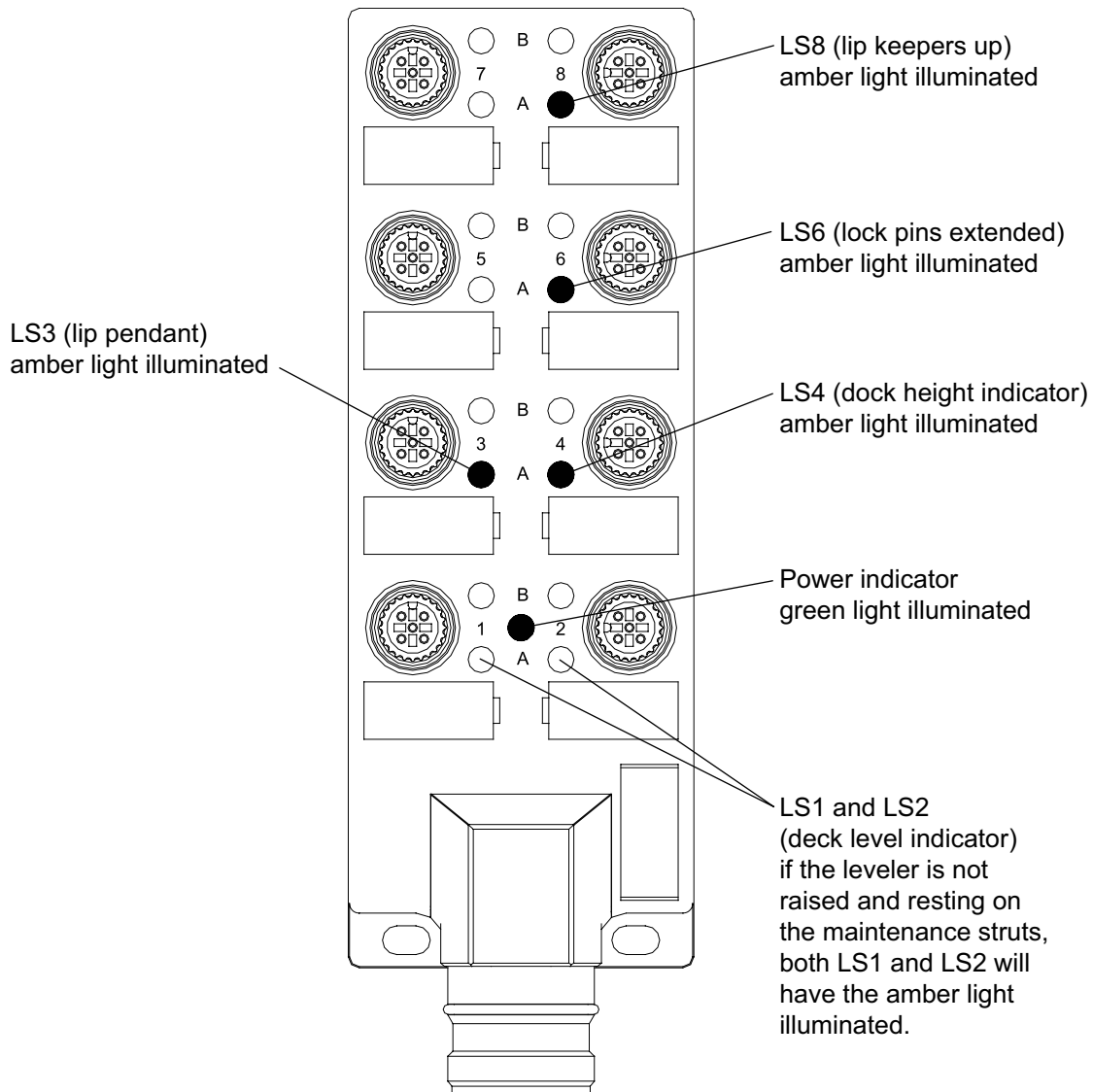
⚠ WARNING

Before servicing the dock leveler and lift combo, read and follow the Safety Practices on pages 3-4 and the Operation section of this manual.

LEVELER MODE LED DISPLAY

The LED display below represents the standard LEVELER MODE condition with the deck raised and resting on the maintenance struts and the lip pendant. This can be used as a troubleshooting starting point to help diagnose the area of concern.

Fig. 55



TROUBLESHOOTING, continued

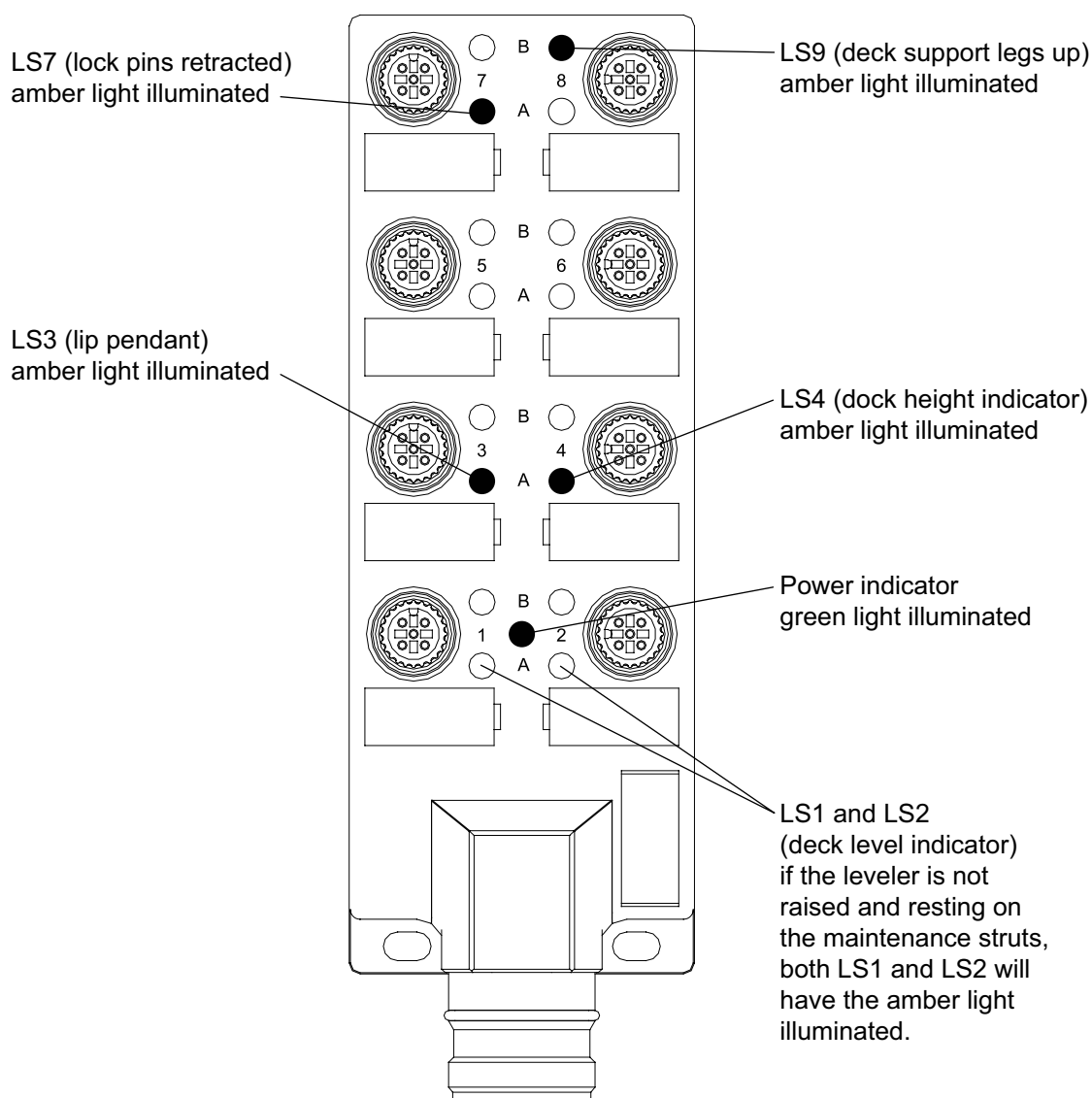
⚠ WARNING

Before servicing the dock leveler and lift combo, read and follow the Safety Practices on pages 3-4 and the Operation section of this manual.

LIFT MODE LED DISPLAY

The LED display below represents the standard LIFT MODE condition at dock height with the deck raised and resting on the maintenance struts and the lip pendant. This can be used as a troubleshooting starting point to help diagnose the area of concern.

Fig. 56



TROUBLESHOOTING, continued

Use the Troubleshooting Guide if ever the leveler fails to perform properly. Find the condition that most closely matches your situation and make the recommended adjustments. Observe all safety warnings before attempting any maintenance procedure.

⚠ WARNING

Before servicing the dock leveler, read and follow the Safety Practices on Pages 3-4 and the Operation section in this manual.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Leveler does not raise. Motor is silent.	a) No electrical power to control panel. b) Electrical connections incorrect or broken.	a) Check that voltage is present at terminal connections to the control panel. b) Check that wiring matches the wiring diagram.
2. Leveler does not raise; motor starts then stops, motor starter relay chatters.	a) Overload relay, main circuit breaker or leveler control circuit breaker tripping out. b) Voltage drop due to long wiring distance from power source.	a) Check overload setting and current draw. b) Check voltage when motor is started. Voltage drop is more often a problem on single phase motors. Acquire conductor specifications from your distributor.
3. Leveler does not raise. Motor hums.	a) Voltage drop. b) Loss of 1 phase.	a) Check voltage when motor is started. Voltage drop is more often a problem on single phase motors. Acquire conductor specifications from your distributor. b) Check for voltage at all three motor connections (T1, T2, T3) in control panel.
4. Leveler does not raise. Motor runs.	a) Low fluid level in reservoir. b) Pump not running or pressure insufficient. c) Pump running in reverse. d) Primary relief valve setting too low.	a) The hydraulic fluid level should be checked when the leveler is resting on the maintenance strut with the lip pendant. Add fluid if required and check for leaks. See page 54, Fig. 58. b) Remove the hose from main lift cylinder and point free end into reservoir opening. If no oil is pumped, replace pump. c) Check motor rotation and change electrical connections if necessary. See motor name plate. d) Set primary relief valve setting to 2000 PSI. See page 54. Note: Requires use of pressure gauge or pump will be severely damaged.

TROUBLESHOOTING, continued

WARNING

Before servicing the dock leveler, read and follow the Safety Practices on Pages 3-4 and the Operation section in this manual.

PROBLEM	POSSIBLE CAUSE	SOLUTION
5. Overload relay tripping.	a) Overload relay set too low. b) Loss of one phase.	a) Check motor full load amperage and overload relay setting. b) Check for voltage at all three motor connections (T1,T2,T3) in control panel.
6. Leveler will not lower.	a) Automatic safety stop (velocity fuse) is locked.	a) If a load was on the leveler, remove the load and jog the RAISE button to unlock the leveler. If no load was on the leveler, adjust the flow control valve to reduce drop speed. See page 54.
7. Leveler floats down too slowly.	a) Flow control requires adjustment.	a) Adjust flow shuttle valve for faster flow. Turn counterclockwise to increase speed. See page 54.
8. Lip plate will not extend, or extends too slowly.	a) Low fluid level in reservoir. b) Sequence valve set too high. c) Lip hinge binding. d) Primary relief valve set too low.	a) Check fluid level with leveler fully raised. Add fluid if required and check for leaks. See page 54, Fig. 58. b) Decrease sequence valve setting. See page 54. c) Inspect hinge area for damage or trapped debris. Lubricate hinge. d) Set primary relief valve to 2000 PSI. See page 54. Note: Requires use of pressure gauge or pump will be severely damaged.
9. Lip plate extends too soon.	a) Sequence valve set too low.	a) Turn clockwise to increase pressure so that the lip plate does not extend until the deck is fully raised.
10. Lip plate will not stay out / falls as leveler is lowering.	a) Pilot operated check valve / valve not closing. b) Lip cylinder damaged.	a) Remove and inspect for foreign matter. Clean as required. b) Replace lip cylinder piston seal, or replace cylinder.

PLC DIAGNOSTICS

⚠ WARNING

Do not service this product unless you have read and followed the Safety Practices, Warnings, and Operating Instructions in this manual. Failure to follow these safety practices could result in death or serious injury.

The level lift is controlled by a programmable logic controller (PLC) which reads input signals from pushbuttons and proximity sensors, and closes the appropriate output relays to the motor, solenoid valves, audible alarm and warning lights.

CONTROLLER FAULT CONDITIONS

RUN LED (green)

- ☐ Application not executed
- ☒ Controller is in RUN mode
- F Controller is in STOP mode, or execution fault (HALT)

ERR LED (red)

- ☐ OK
- ☒ Internal faults (watchdog, etc.)
- F Application not executable, or execution error (HALT)

STAT LED (green)

- ☐ Controlled by the user or application through system bit %S69
- ☒ Controlled by the user or application through system bit %S69
- F Program transfer in progress

LIFT MODE

Normal operating sequence; at any floor level and ready to operate.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	IN
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PWR	RUN	ERR	STAT	BAT	COM																			
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OUT

LEVELER MODE

Normal operating sequence; stored and ready to operate

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	IN
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PWR	RUN	ERR	STAT	BAT	COM																			
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OUT

LEGEND

- ☐ LED OFF
- ☒ LED ON
- F LED flashing
- E LED ON or OFF (either condition may be present during the course of given sequence)

ADJUSTMENTS — LEVELER HYDRAULIC POWER UNIT

⚠ DANGER

Be certain, before entering the dock leveler and lift combo pit or doing any maintenance or repair under the dock leveler and lift combo that:

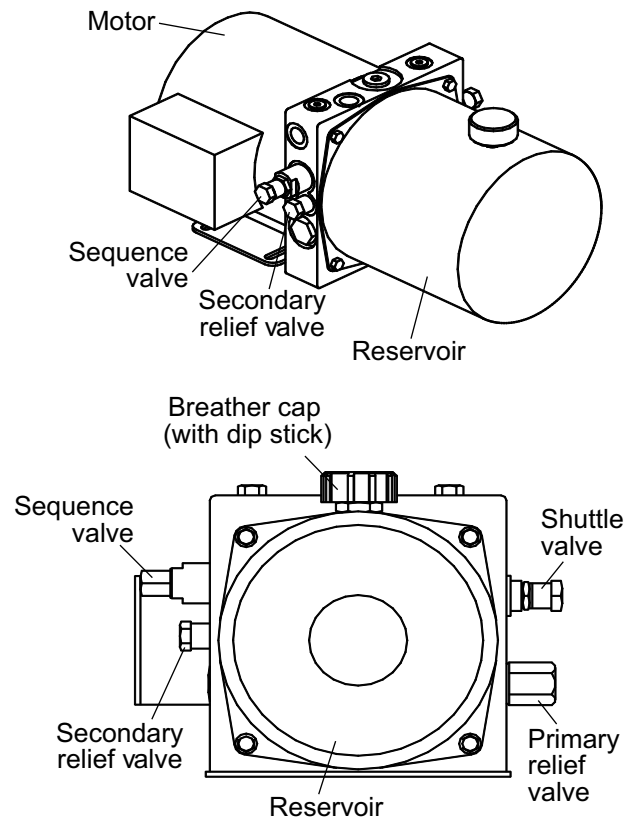
- 1) The safety blocks are in place on the scissor frame.
- 2) The maintenance struts are securely supporting the leveler portion.
- 3) The power is disconnected and properly tagged or locked out.

⚠ WARNING

Before servicing the dock leveler and lift combo, read and follow the Safety Practices on pages 3-4 and the Operation section of this manual.

Place barricades on the dock floor around the dock leveler and lift combo pit and in the driveway in front of the pit while installing, maintaining or repairing the unit.

Fig. 57



ADJUSTMENTS — LEVELER HYDRAULIC POWER, continued

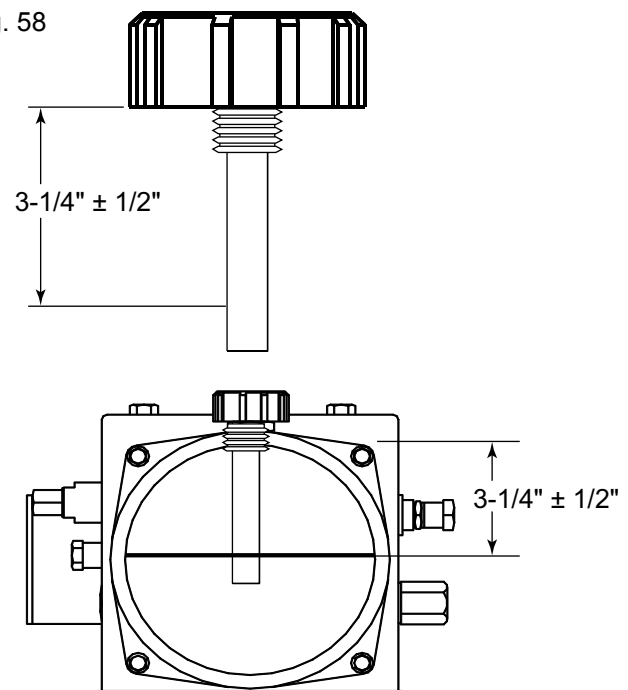
Description	Purpose	Adjustment
Primary Relief Valve	Controls maximum pressure in the hydraulic system and protects the other components from excessive force.	Remove threaded cap. Turn screw clockwise to increase relief pressure. Relief pressure will be factory set at 2000 PSI and should not require adjustment. Note: a suitable hydraulic pressure gauge MUST BE USED when adjusting.
Flow Control and Shuttle Valve	Controls the lowering speed of the ramp plate and directs fluid to the cylinders when the pump is running.	Remove threaded cap. Turn the screw clockwise to decrease lowering speed. Adjust the lowering speed to approximately equal the ramp raise speed.
Sequence Valve	Controls lip plate retraction and extension.	Remove threaded cap. If the lip extends before the ramp is fully raised, the valve should be turned clockwise. Tightening the valve too far will cause very slow lip extension, or no extension at all.
Solenoid Valve	Stops the fall of the top plate when either the LIP EXTEND or LEVELER STOP button is pushed.	No adjustment required.
Secondary Relief Valve	Controls the force and speed of lip retraction when the power unit is running. (Does not affect speed of lip closing when power unit is not running.)	Remove threaded cap. If the lip is closing too forcefully, turn the adjusting screw clockwise. If the lip is not closing fully when the lip is above the keepers, turn the adjusting screw counterclockwise.

HYDRAULIC FLUID LEVEL

The hydraulic fluid level should be checked when the leveler is resting on the maintenance strut with the lip pendant.

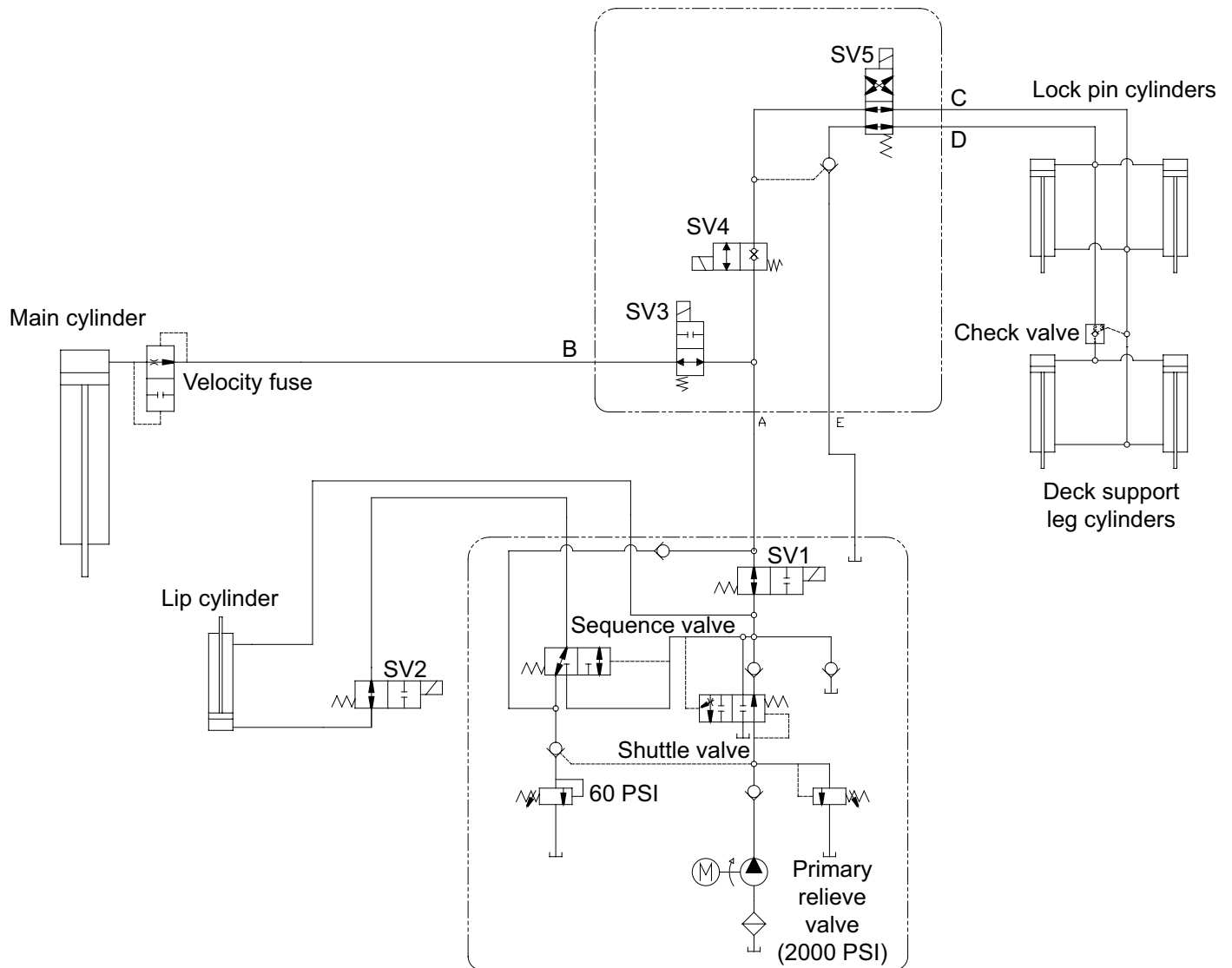
The fluid level in reservoir should be approximately 1/2 full (3-1/4" plus or minus 1/2" down from breather cap when measured on the dipstick). See Fig. 58. If the level is low, fill to the halfway point using an approved oil from the list on page 32.

Fig. 58



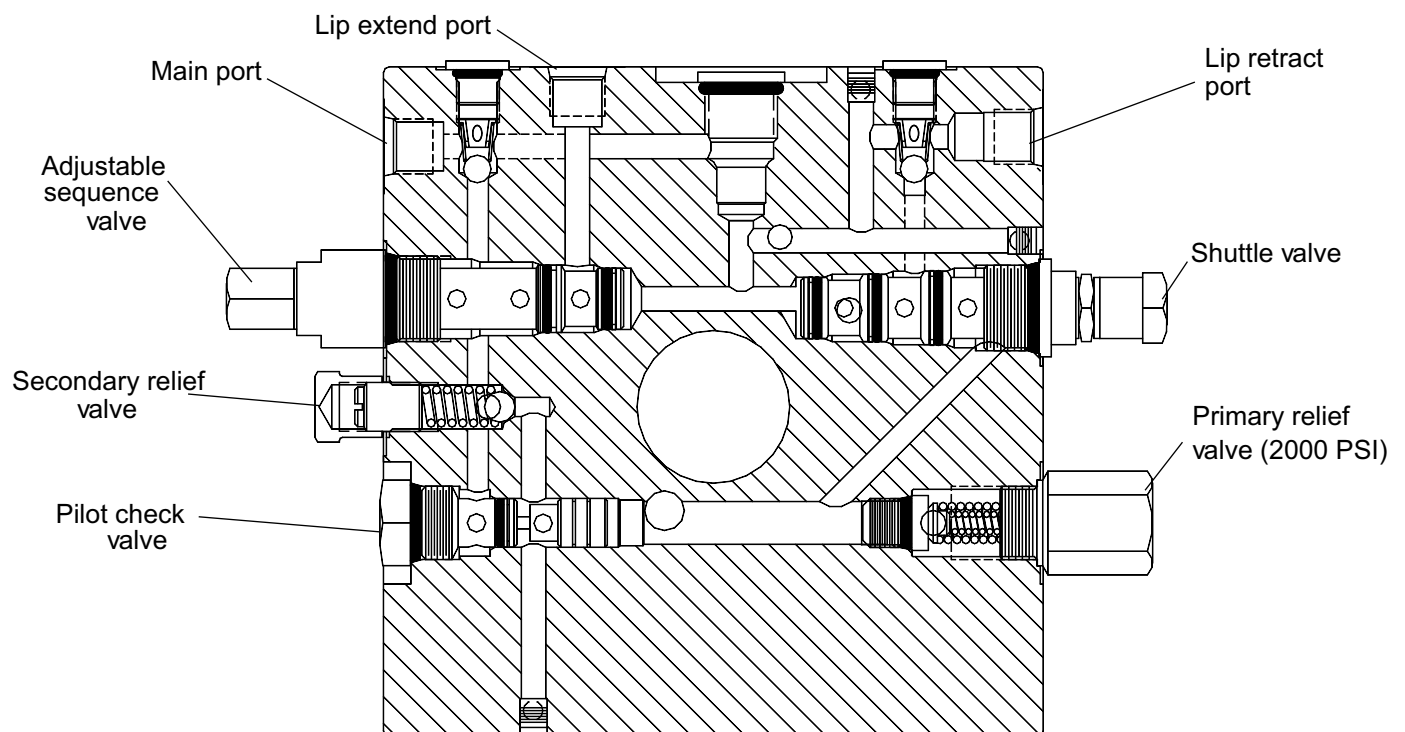
HYDRAULIC SCHEMATIC — LEVELER

Fig. 59



HYDRAULIC VALVE CROSS SECTION — LEVELER

Fig. 60



ADJUSTMENTS — LIFT HYDRAULIC POWER UNIT

▲ DANGER

Be certain, before entering the dock leveler and lift combo pit or doing any maintenance or repair under the dock leveler and lift combo that:

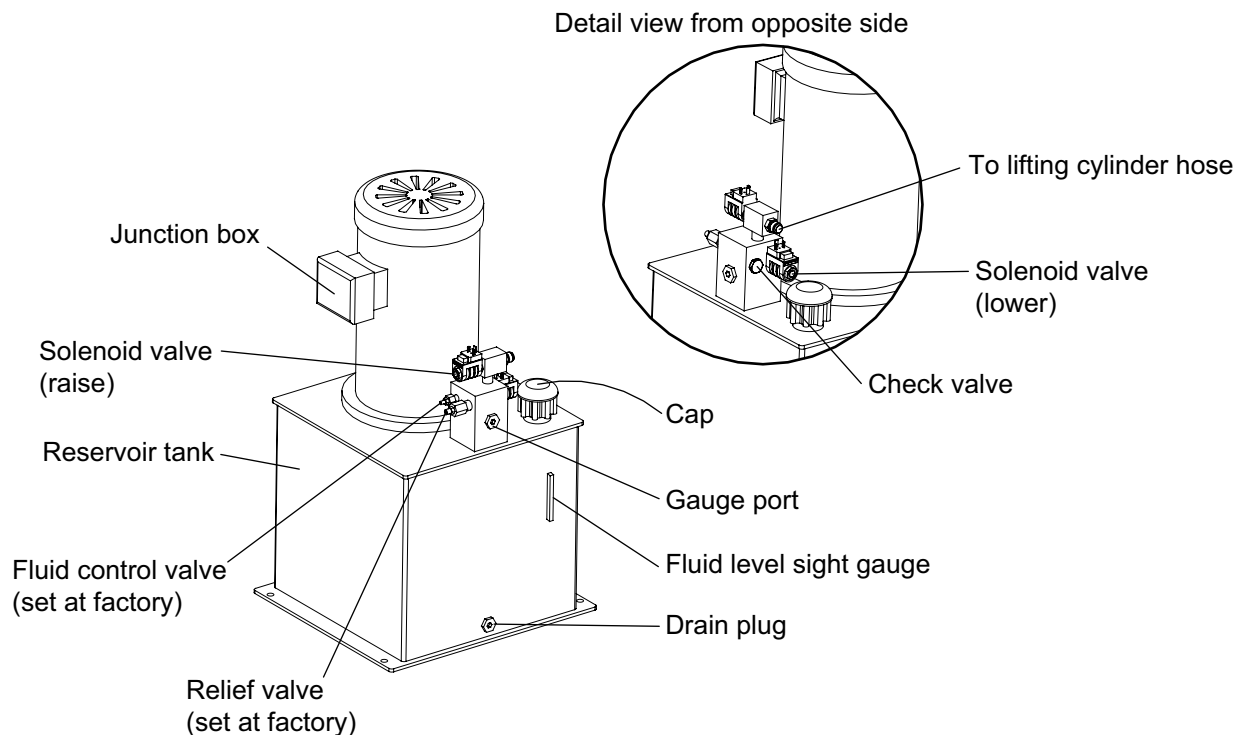
- 1) The safety blocks are in place on the scissor frame.*
- 2) The maintenance struts are securely supporting the leveler portion.*
- 3) The power is disconnected and properly tagged or locked out.*

▲ WARNING

Before servicing the dock leveler and lift combo, read and follow the Safety Practices on pages 3-4 and the Operation section of this manual.

Place barricades on the dock floor around the dock leveler and lift combo pit and in the driveway in front of the pit while installing, maintaining or repairing the unit.

Fig. 61



ADJUSTEMENTS — LIFT HYDRAULIC POWER UNIT, continued

Description	Purpose	Adjustment
Relief Valve	Controls maximum pressure in the hydraulic lift system and prevents other components from excessive force. Relief Valve pressure is set at the factory, contact your local distributor if there is belief adjustment is required.	Factory Set, No adjustment required
Fluid Control Valve	Controls the lower speed of the unit and directs fluid to the cylinders when the pump is running.	Factory Set, No adjustment required
Solenoid Valve, Raise	Stops the unit from rising once the lift RAISE button is released.	No adjustment required
Solenoid Valve, Lower	Stops the unit from lowering when the lift LOWER button is released.	No adjustment required

HYDRAULIC FLUID LEVEL - REMOTE MOUNTED

The hydraulic fluid level for the remote mounted lift power unit should be checked when the dock leveler and lift combo is in the fully lowered position at grade level. See Fig. 61. Check the fluid level sight gauge on the lift power unit. Ensure the fluid level is 2" above the bottom of the sight glass. If the fluid level is low, fill to the appropriate level using approved oil from the list on page 32.

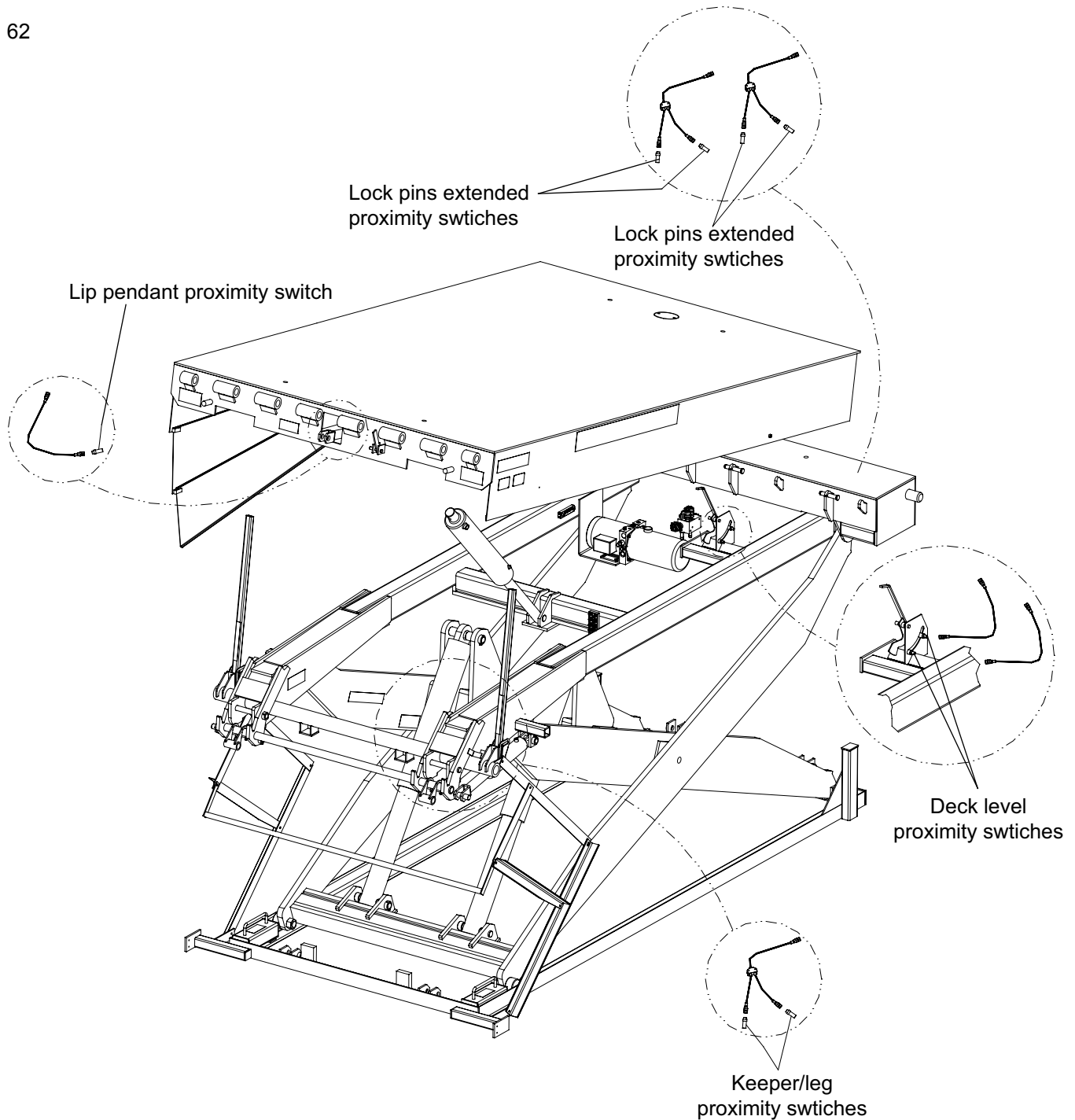
HYDRAULIC FLUID LEVEL - PIT MOUNTED

The hydraulic fluid level for the pit mounted lift power unit should be checked when the dock leveler and lift combo is in the fully lowered position at grade level. See Fig. 61. Check the fluid level sight gauge on the lift power unit. Ensure the fluid level is 1" above the bottom of the sight glass. If the fluid level is low, fill to the appropriate level using approved oil from the list on page 32.

ADJUSTEMENTS — PROXIMITY SWITCHES

There are a total of 9 proximity switches used on the Dock Leveler and Lift Combo. See Fig. 62 for location of these proximity switches on the unit. Check the separation of the proximity switch and the respective target. Also ensure the electrical cable connector is seated firmly on the switch. This should be done quarterly and included with other scheduled maintenance. See Fig. 64 on page 62 for separation detail.

Fig. 62



ADJUSTEMENTS — PROXIMITY SWITCHES, continued

The following table shows which maintenance devices need to be in place while adjusting the proximity switches.

This chart also shows what mode the unit needs to be positioned in for servicing a certain proximity switch.

NOTE:

Certain positions can only be achieved in Service Mode.

▲ DANGER

Do not enter the pit area under the Dock Leveler and Lift Combo to make switch adjustments unless the scissor motor is off and safety devices are in place per the table below.

Proximity Switch	Serviced in Leveler Mode	Serviced in Lift Mode	Safety Devices In Place		
			Safety Stop Blocks	Deck Maintenance Struts	Lip Maintenance Prop
Deck Level & Above (LS1)	X*	X*	X		not required
Deck Level & Below (LS2)	X*	X*	X		not required
Lip Pendant (LS3)	X		X	X	not used
Lock Pins Extended (LS6A & LS6B)	X		X	X	not required
Lock Pins Retracted (LS7A & LS7B)		X	X	X**	not required
Lip Keepers Up (LS8)	X		X	X	not required
Deck Support Legs Up (LS9)		X	X	X**	not required

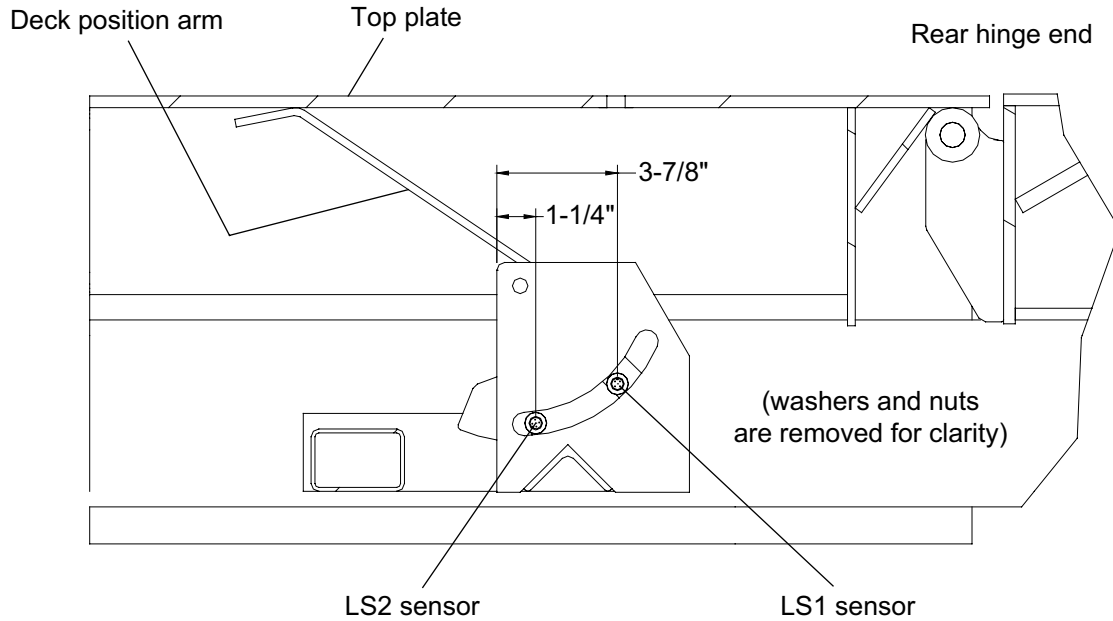
X* - adjusted in either mode, see Fig. 63 on page 61 for proper sensor location.

X** - position can only be achieved in Service Mode

ADJUSTEMENTS — PROXIMITY SWITCHES, continued

The deck position sensors must be positioned correctly for the Dock Leveler and Lift Combo to function properly. See Fig. 63 for correct position for the LS1 and LS2 sensors.

Fig. 63

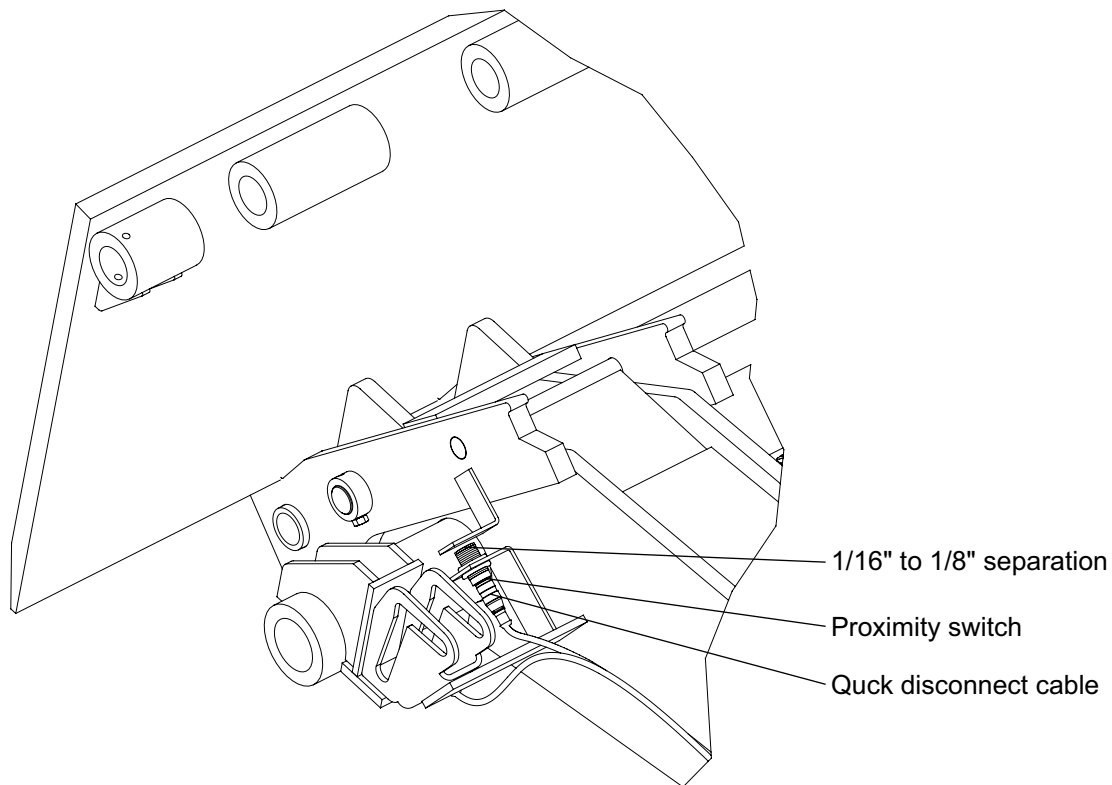


With the sensors positioned correctly, the sensors should be ON under the following conditions:

Sensor	Deck Level (0°)	3° Above and Beyond	Below Dock
LS1	ON		
LS2	ON		ON

ADJUSTEMENTS — PROXIMITY SWITCHES, CONTINUED

Fig. 64



There are 9 proximity switches used on the Dock Leveler and Lift Combo. See Fig. 64. These switches need to be checked quarterly to ensure proper separation, proper connection to the electrical cable and proper fitting to the mounting bracket.

PROXIMITY SWITCH SEPARATION

The separation range should be $\frac{1}{16}$ " to $\frac{1}{8}$ " between the target and switch.

PROXIMITY SWITCH CONNECTION TO CABLE

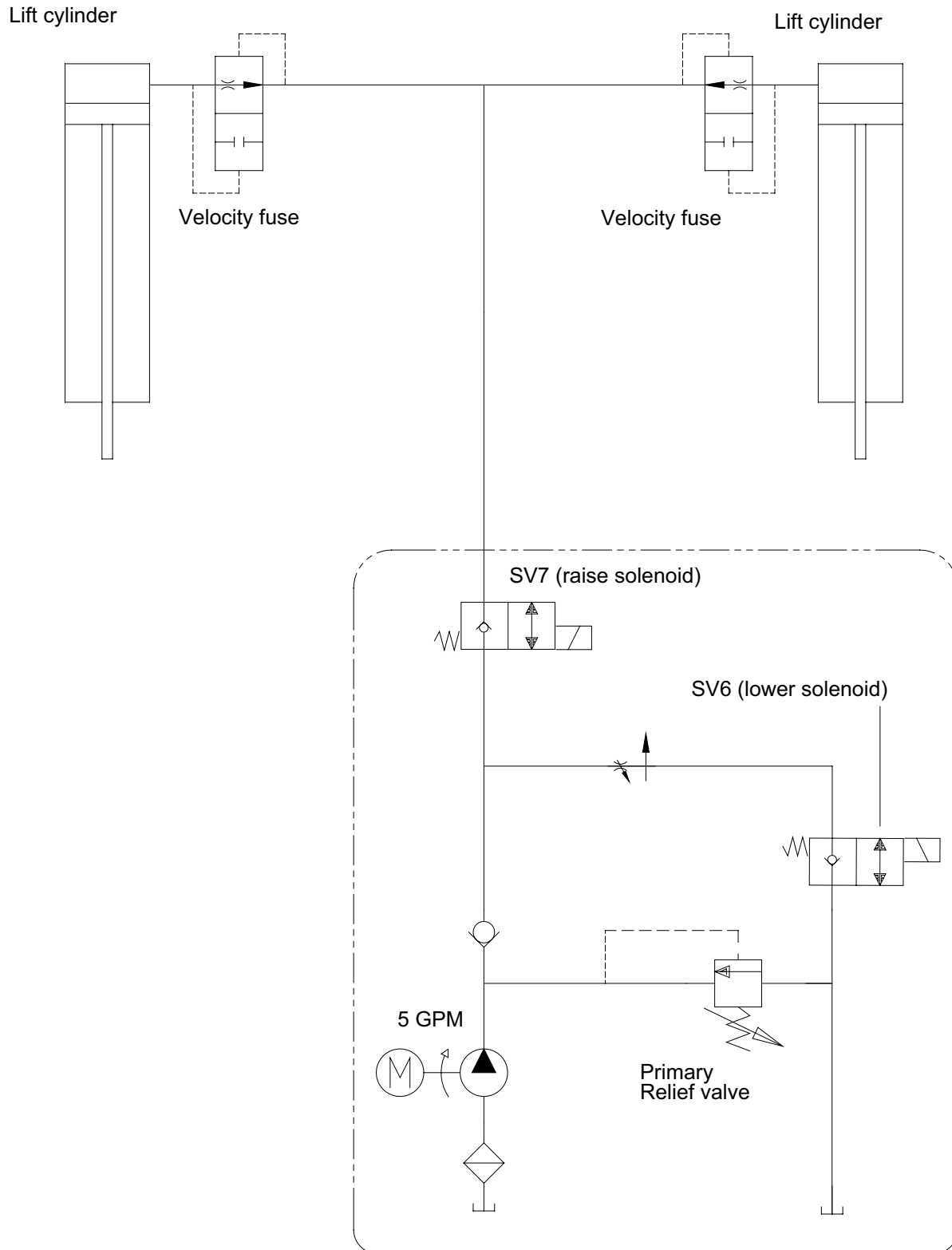
The proximity switches are connected to an electrical cable. This is a threaded connection and needs to be checked quarterly to ensure proper connection. There should be a solid connection between the switch and cable, tighten if needed by hand.

PROXIMITY FITTING TO MOUNTING BRACKET

There are two nuts attaching the proximity switch to the mounting bracket. Ensure this is a tight connection, use two $\frac{15}{16}$ " open end wrenches to tighten if needed.

HYDRAULIC SCHEMATIC — LIFT

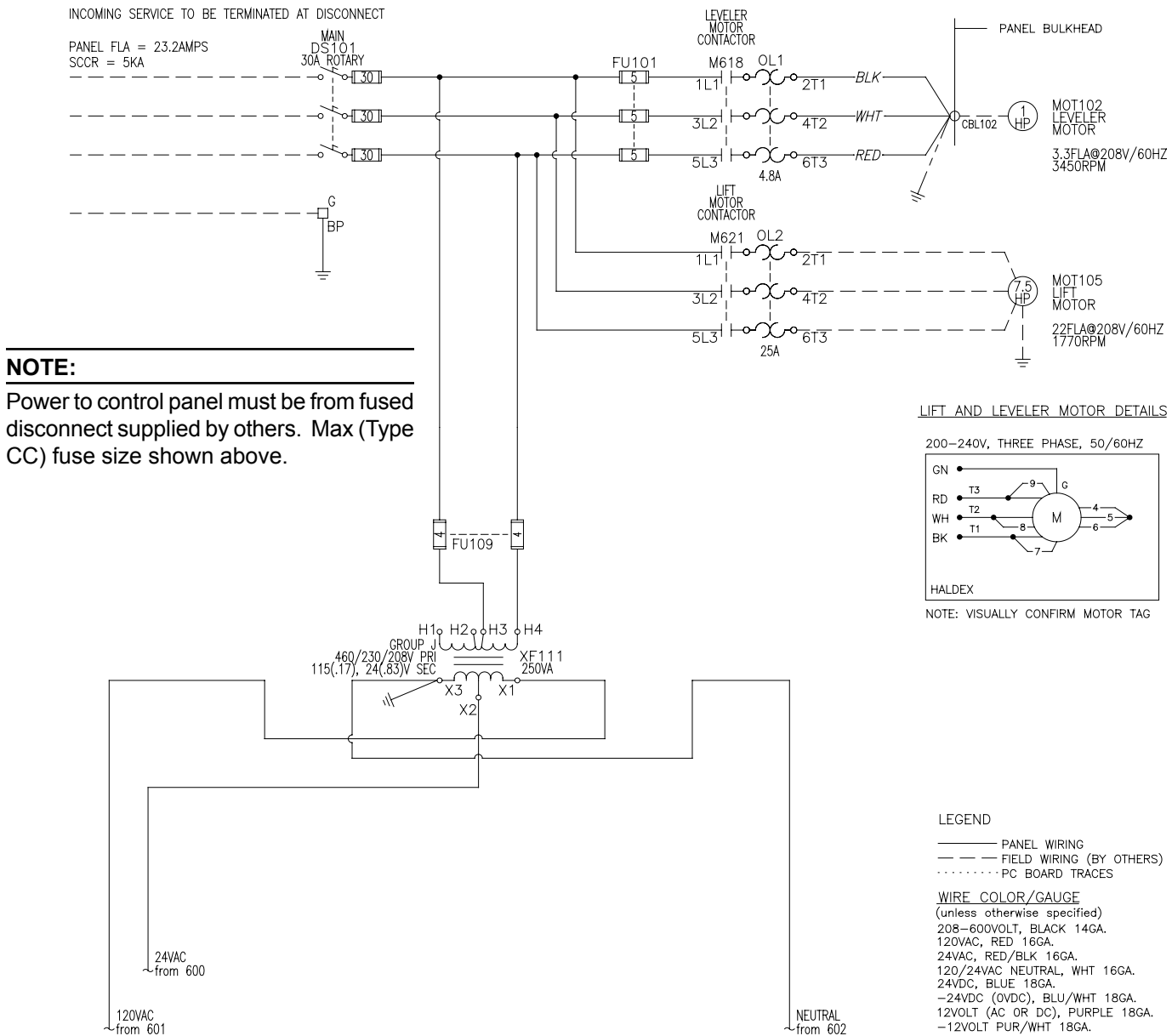
Fig. 65



ELECTRICAL SCHEMATIC

Fig. 66

208V, 3 PHASE, 60 HZ



⚠ DANGER

Before doing any electrical work, make certain the power is disconnected and properly tagged or locked off. All electrical work must be done by a qualified technician and meet all applicable codes. If it is necessary to make troubleshooting checks inside the control box with the power on, USE EXTREME CAUTION. Do not place your fingers or uninsulated tools inside the control box. Touching wires or other parts inside the control box could result in electrical shock, death or serious injury.

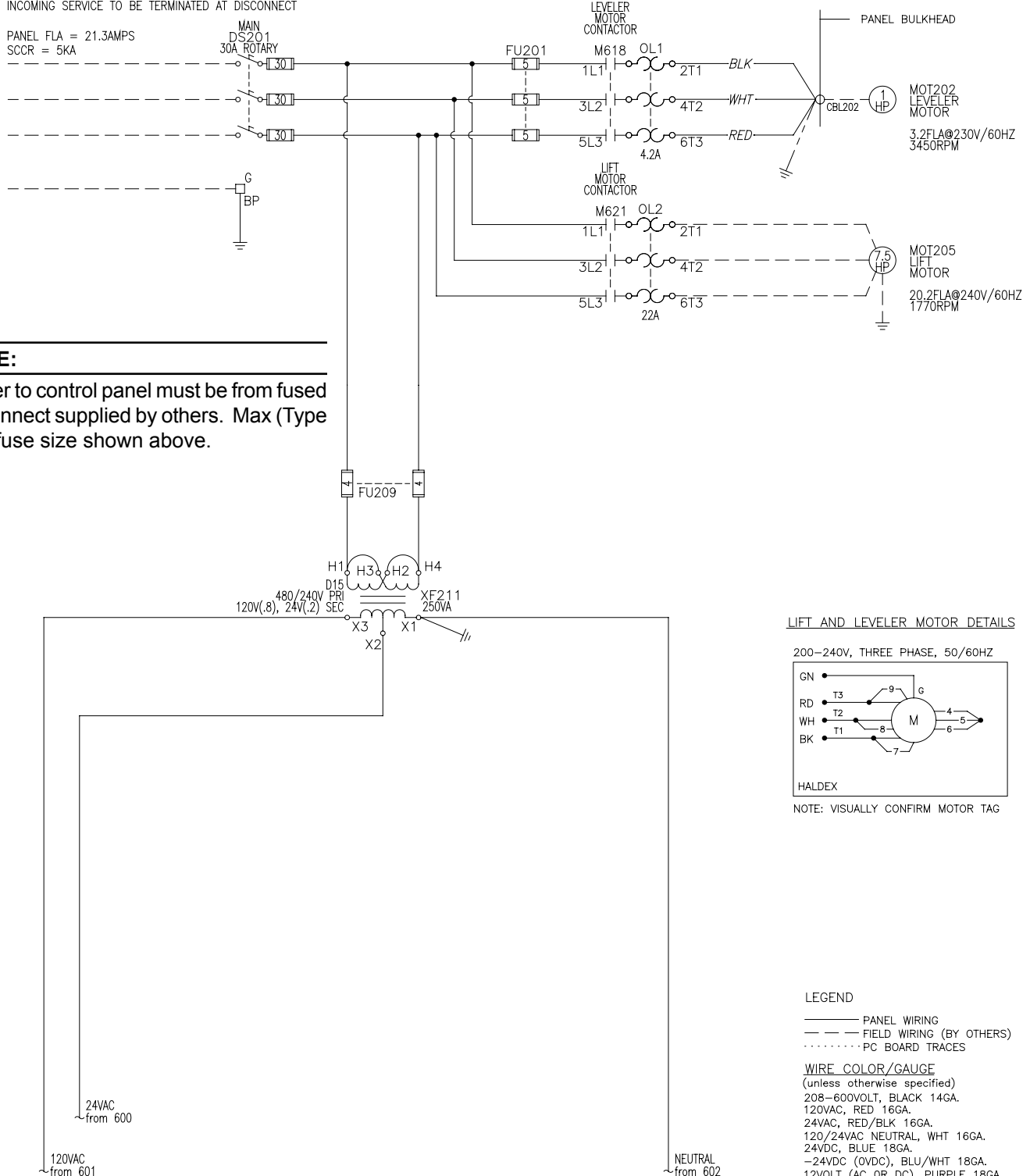
ELECTRICAL SCHEMATIC, continued

Fig. 67

240V, 3 PHASE, 60 HZ

INCOMING SERVICE TO BE TERMINATED AT DISCONNECT

PANEL FLA = 21.3AMPS
SCCR = 5KA



ELECTRICAL SCHEMATIC, continued

Fig. 68

380V, 3 PHASE, 50 HZ

INCOMING SERVICE TO BE TERMINATED AT DISCONNECT

PANEL FLA = 10.8AMPS
SCCR = 5KA

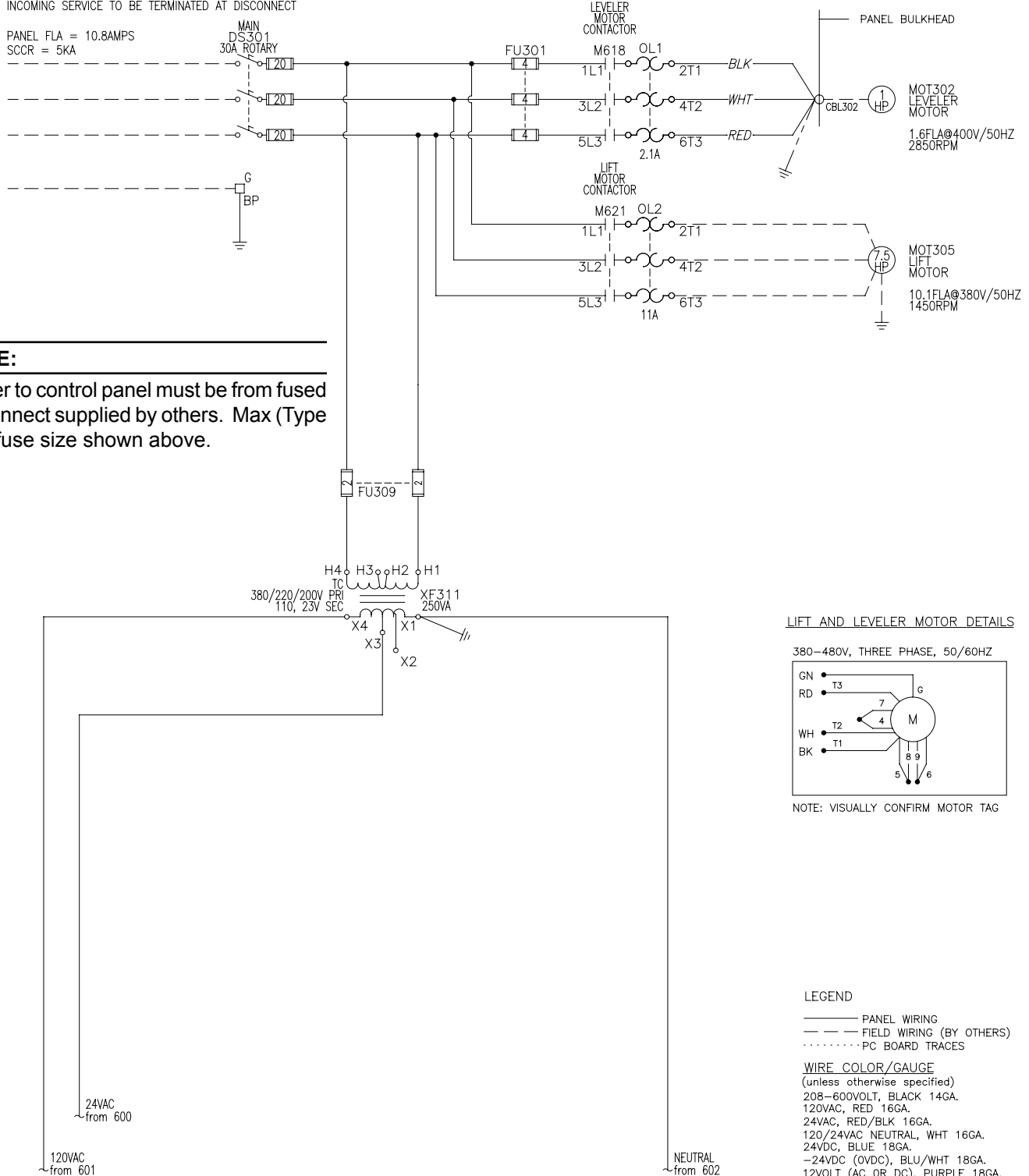
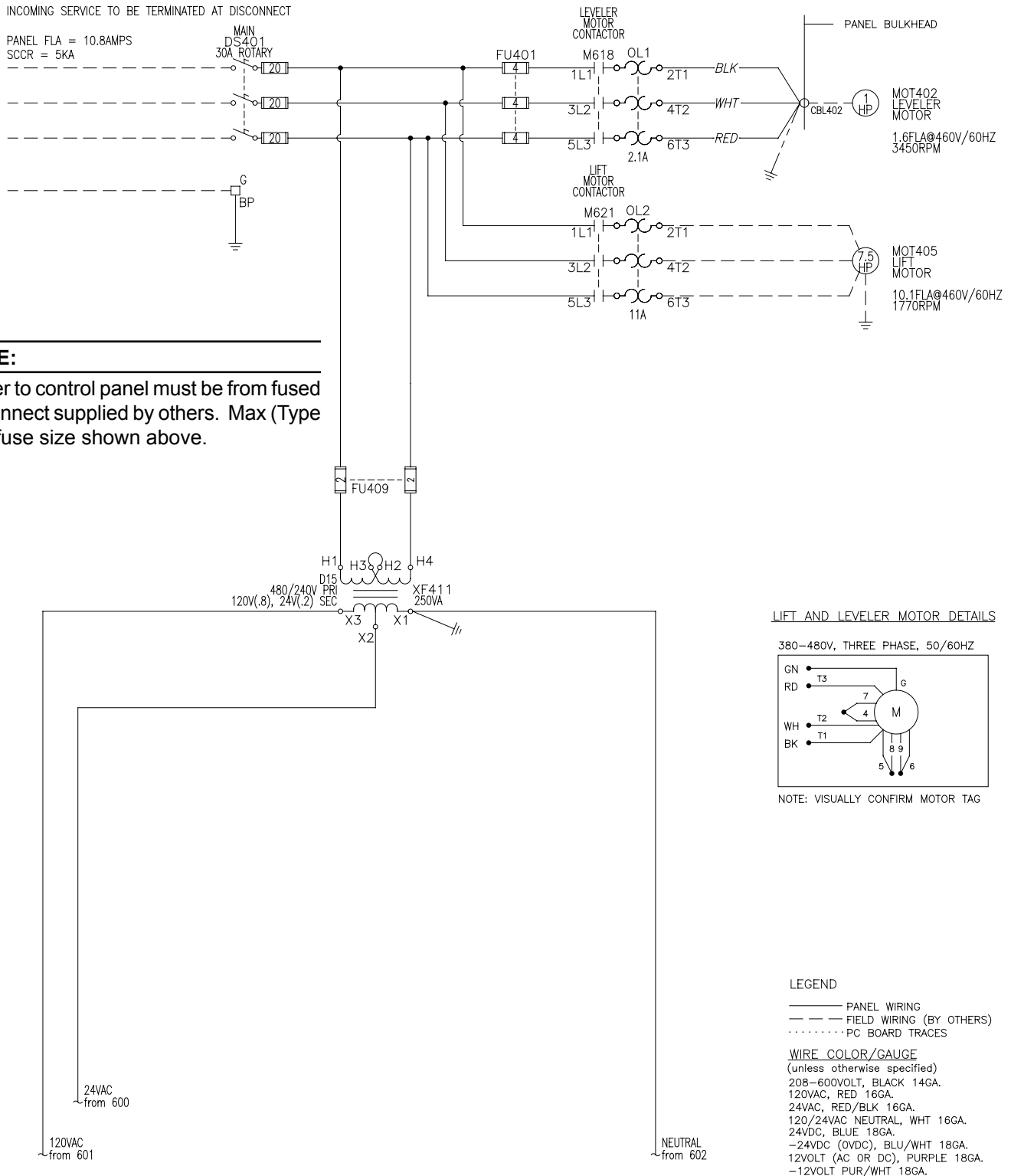


Fig. 69

480V, 3 PHASE, 60 HZ



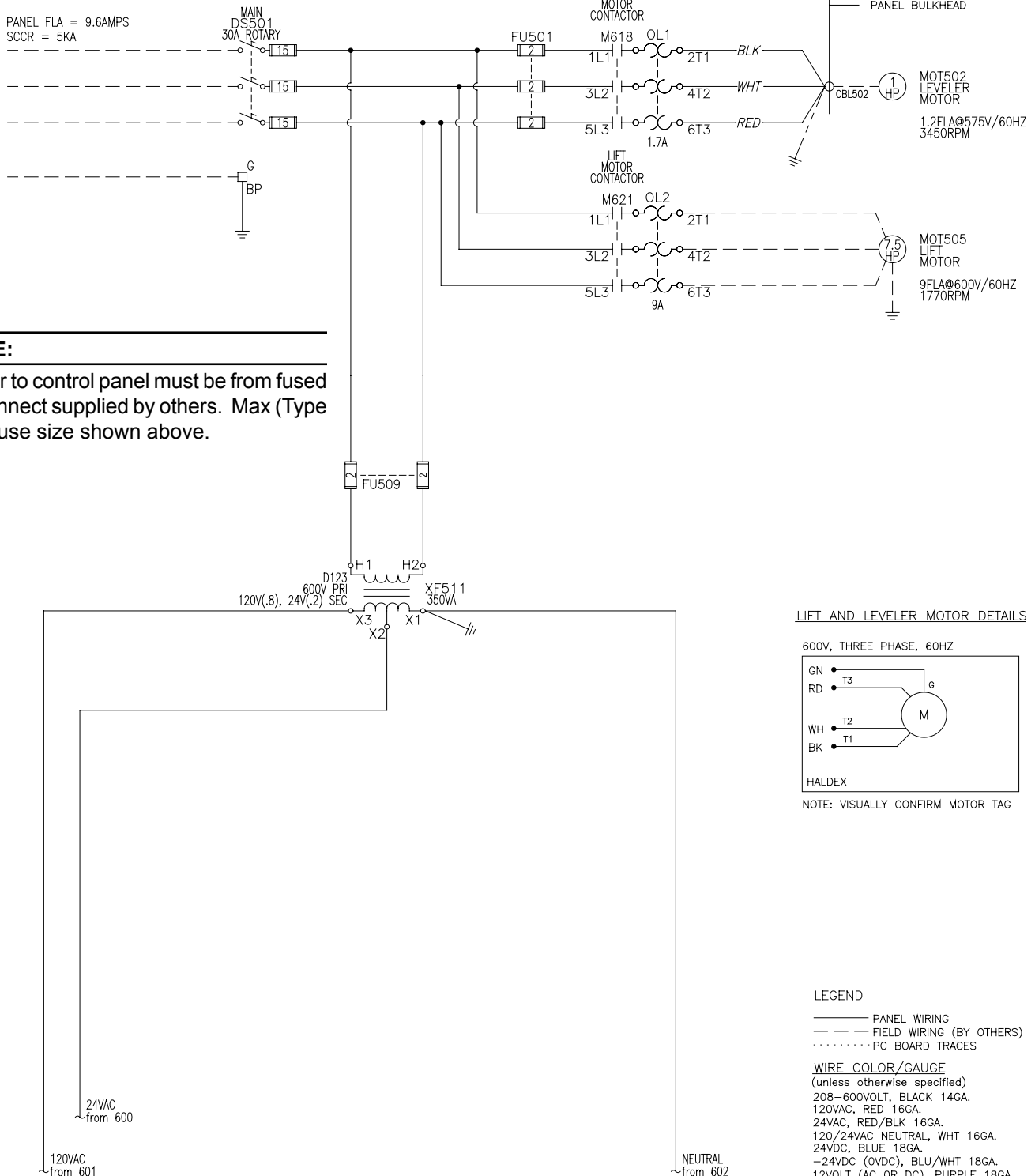
ELECTRICAL SCHEMATIC, continued

Fig. 70

600V, 3 PHASE, 50 HZ

INCOMING SERVICE TO BE TERMINATED AT DISCONNECT

PANEL FLA = 9.6AMPS
SCCR = 5KA



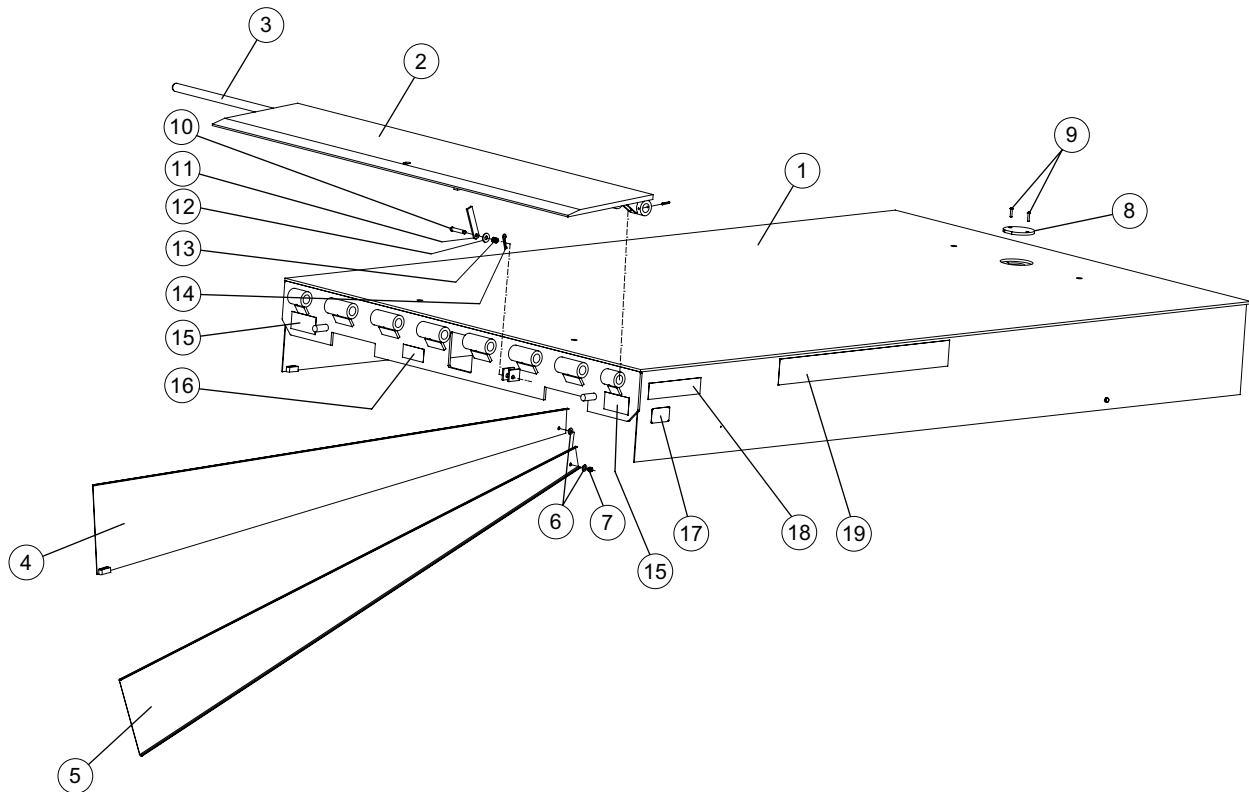
PARTS LIST

Top plate and lip plate assembly

⚠ WARNING

To ensure proper function, durability and safety of the product, only replacement parts that do not interfere with the safe, normal operation of the product must be used. Incorporation of replacement parts or modifications that weaken the structural integrity of the product, or in any way alter the product from its normal working condition at the time of purchase from 4Front Engineered Solutions, Inc. could result in product malfunction, breakdown, premature wear, death or serious injury.

Fig. 71



PARTS LIST, continued

Top plate and lip plate assembly

Item	Qty.	Part Description	Part Number
1	1	Top Plate Assembly, 6 ft. wide x 8 ft. long	6008866
	1	Top Plate Assembly, 6.5 ft. wide x 8 ft. long	6005402
	1	Top Plate Assembly, 7 ft. wide x 8 ft. long	6008867
	1	Top Plate Assembly, 6 ft. wide x 10 ft. long	6008868
	1	Top Plate Assembly, 6.5 ft. wide x 10 ft. long	6008308
	1	Top Plate Assembly, 7 ft. wide x 10 ft. long	6008869
	1	Top Plate Assembly, 6 ft. wide x 12 ft. long	6008870
	1	Top Plate Assembly, 6.5 ft. wide x 12 ft. long	6005568
	1	Top Plate Assembly, 7 ft. wide x 12 ft. long	6008871
	1	Top Plate Assembly, 6 ft. wide x 10 ft. long (DGL)	6008881
	1	Top Plate Assembly, 6.5 ft. wide x 10 ft. long (DGL)	6008882
	1	Top Plate Assembly, 7 ft. wide x 10 ft. long (DGL)	6008883
	1	Top Plate Assembly, 6 ft. wide x 12 ft. long (DGL)	6008884
	1	Top Plate Assembly, 6.5 ft. wide x 12 ft. long (DGL)	6008885
	1	Top Plate Assembly, 7 ft. wide x 12 ft. long (DGL)	6008886
2	1	Lip Plate Assembly, 6 ft. wide x 18 in. long	6009291
	1	Lip Plate Assembly, 6 ft. wide x 20 in. long	6009292
	1	Lip Plate Assembly, 6.5 ft. wide x 18 in. long	6005459
	1	Lip Plate Assembly, 6.5 ft. wide x 20 in. long	6005583
	1	Lip Plate Assembly, 7 ft. wide x 18 in. long	6009293
	1	Lip Plate Assembly, 7 ft. wide x 20 in. long	6009294
	1	Lip Plate Assembly, 6 ft. wide x 18 in. long, DGL	6009295
	1	Lip Plate Assembly, 6 ft. wide x 20 in. long, DGL	6009296
	1	Lip Plate Assembly, 6.5 ft. wide x 18 in. long, DGL	6009297
	1	Lip Plate Assembly, 6.5 ft. wide x 20 in. long, DGL	6009298
	1	Lip Plate Assembly, 7 ft. wide x 18 in. long, DGL	6009299
	1	Lip Plate Assembly, 7 ft. wide x 20 in. long, DGL	6009300
3	1	Lip Hinge Pin, 6 ft. wide	5860287
	1	Lip Hinge Pin, 6.5 ft. wide	5861495
	1	Lip Hinge Pin, 7 ft. wide	5860392
4	1	Toe Guard, 1st Stage, LH, 8 ft. long	5860438
	1	Toe Guard, 1st Stage, RH, 8 ft. long	5860439
	1	Toe Guard, 1st Stage, LH, 10 ft. long	5861043
	1	Toe Guard, 1st Stage, RH, 10 ft. long	5861042
	1	Toe Guard, 1st Stage, LH, 12 ft. long	5862737
	1	Toe Guard, 1st Stage, RH, 12 ft. long	5862738
5	1	Toe Guard, 2nd Stage, LH, 8 ft. long	5860440
	1	Toe Guard, 2nd Stage, RH, 8 ft. long	5860441
	1	Toe Guard, 2nd Stage, LH, 10 ft. long	5861045
	1	Toe Guard, 2nd Stage, RH, 10 ft. long	5861044
	1	Toe Guard, 2nd Stage, LH, 12 ft. long	5862739
	1	Toe Guard, 2nd Stage, RH, 12 ft. long	5862740
6	6	Plain Washer, 7/16" I.D.	234101
7	2	Hex Nut, 3/8" Nylock	214538
8	1	Cover, Auxilliary Port	6008349
9	2	Flat Head Cap Screw, 1/4-20 x 1" Long	211710

PARTS LIST, continued

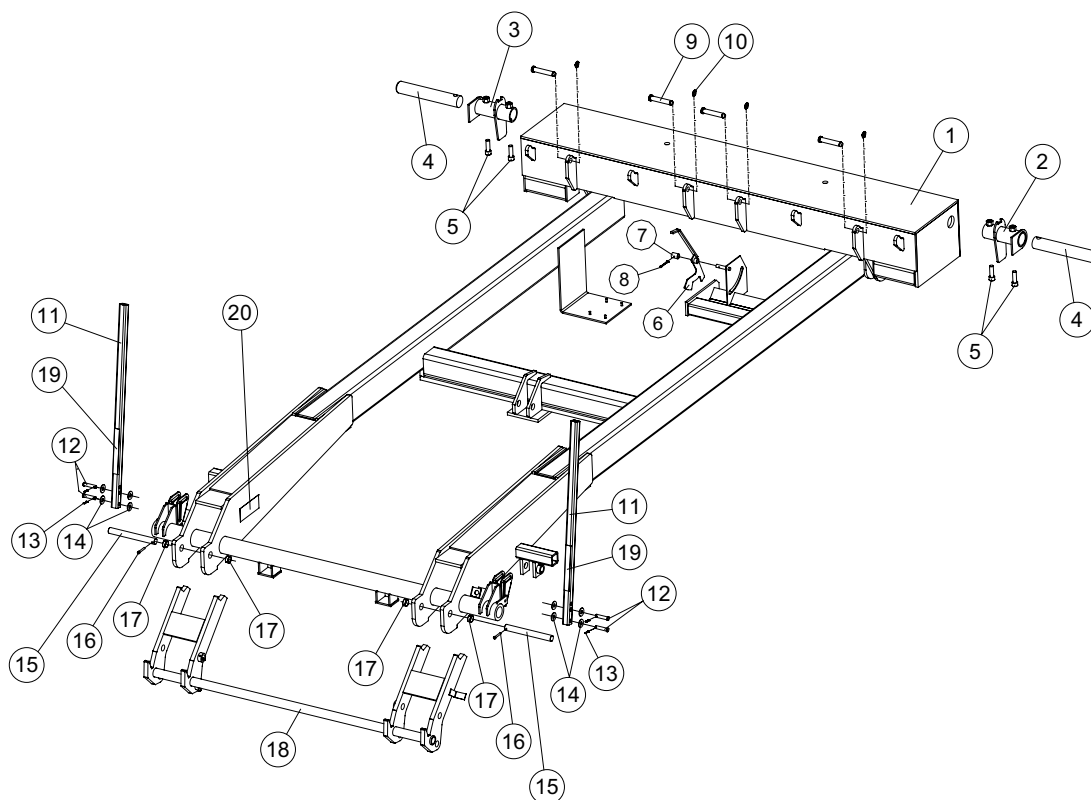
Top plate and lip plate assembly

Item	Qty.	Part Description	Part Number
10	1	Clevis Pin, 1/2" Dia. X 2-3/4" Long	231502
11	1	Lip Plate Maintenance Bar	5862969
12	1	Plain Washer, 9/16" I.D.	234121
13	1	Compression Spring	332069
14	1	Hitch Pin Clip	231503
15	2	Label, Danger, Maintenance Struts	921217
16	1	Label, Warning, A.R.T.D.	921075
17	1	Serial Tag	6009761
18	1	Label, Danger, Safety Instructions	6008485
19	1	Label, Lift Rated Capacity, Serco	6008547
	1	Label, Lift Rated Capacity, Kelley	6008548

PARTS LIST, continued

Deck subframe assembly

Fig. 72



Item	Qty.	Part Description	Part Number
1	1	Deck Subframe Assembly, 6 ft. wide x 8 ft. long	6009309
	1	Deck Subframe Assembly, 6.5 ft. wide x 8 ft. long	6005445
	1	Deck Subframe Assembly, 7 ft. wide x 8 ft. long	6009312
	1	Deck Subframe Assembly, 6 ft. wide x 10 ft. long	6009310
	1	Deck Subframe Assembly, 6.5 ft. wide x 10 ft. long	6008304
	1	Deck Subframe Assembly, 7 ft. wide x 10 ft. long	6009313
	1	Deck Subframe Assembly, 6 ft. wide x 12 ft. long	6009311
	1	Deck Subframe Assembly, 6.5 ft. wide x 12 ft. long	6005880
	1	Deck Subframe Assembly, 7 ft. wide x 12 ft. long	6009314
	1	Deck Subframe Assembly, 6 ft. wide x 12 ft. long	6009314
2	1	Lock Pin Adapter, Right	6005484
3	1	Lock Pin Adapter, Left	6005486
4	2	Lock Pin	6005480
5	4	Socket Head Cap Screw, 5/8-11 x 3" long	000466
6	1	Deck Level Target Assembly	6008322
7	1	Cap Tube, Deck Level	6008325
8	1	Cotter Pin, 5/32" x 2" long	6001832
9	4	Deck Pivot Pin, 3/4" Dia.	5861467

PARTS LIST, continued

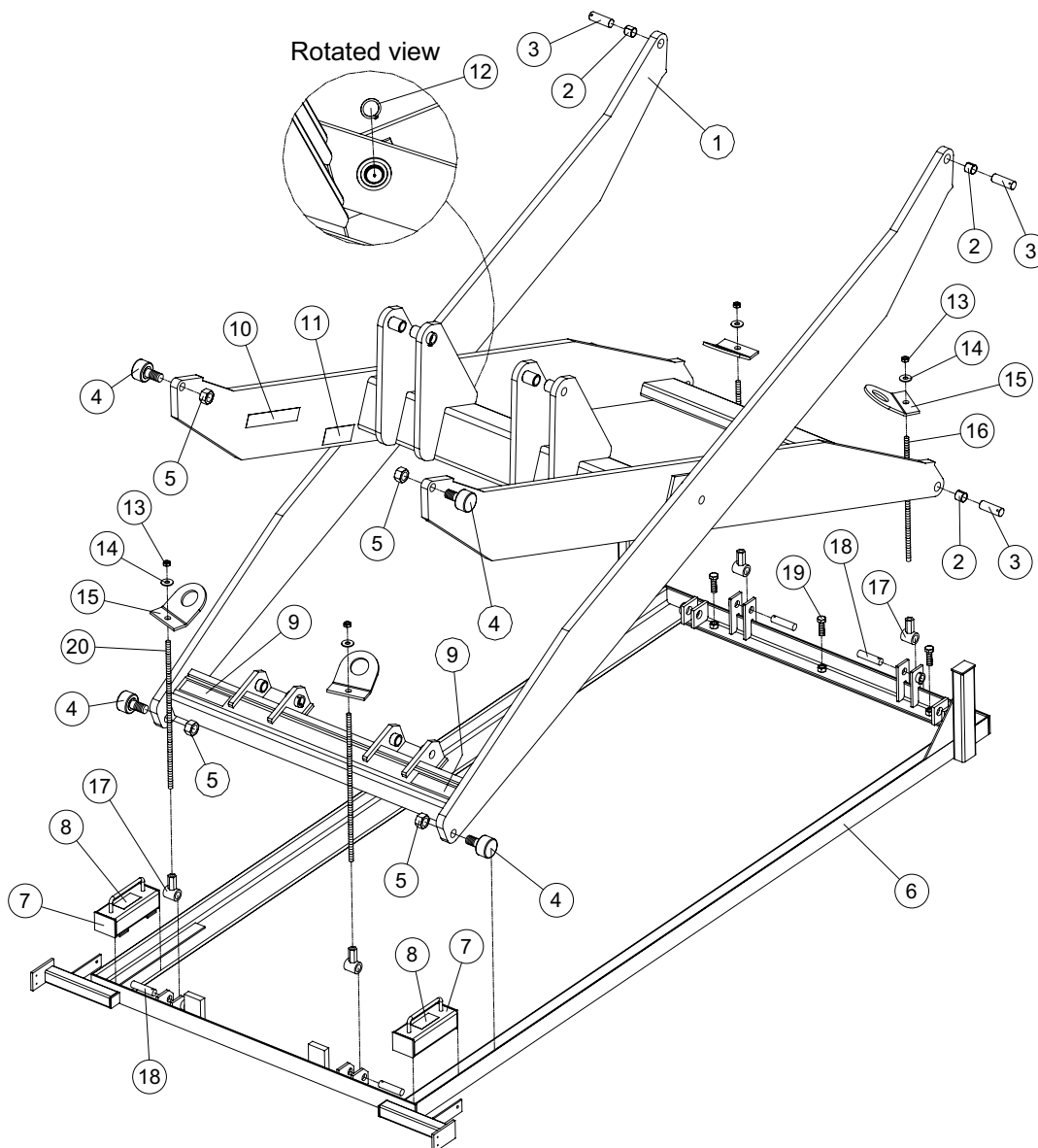
Deck subframe assembly

Item	Qty.	Part Description	Part Number
10	4	Hitch Pin Clip	231503
11	2	Maintenance Strut	6005417
12	4	Clevis Pin, 1/2" Dia. x 2-1/4" long	231506
13	4	Cotter Pin, 1/8" x 3/4" long	231341
14	8	Plain Washer, 9/16" I.D.	234121
15	2	Pin, Deck Support Leg / Keeper Assy, 8 ft. units	6005496
	2	Pin, Deck Support Leg / Keeper Assy, 10 and 12 ft. units	6008407
16	2	Socket Head Cap Screw, 1/4-20 x 1-3/4" long	131300
17	4	DU Bearing, 1" I.D.	6005495
18	1	Deck Support Leg / Keeper Assy, 18" Lip, 8 ft. units	6008339
	1	Deck Support Leg / Keeper Assy, 20" Lip, 8 ft. units	6008887
	1	Deck Support Leg / Keeper Assy, 18" Lip, 10 and 12 ft. units	6008346
	1	Deck Support Leg / Keeper Assy, 20" Lip, 10 and 12 ft. units	6008392
19	2	Label, Danger, Maintenance Strut	921074
20	1	Label, Danger, Entering Pit	921070

PARTS LIST, continued

Scissor assembly

Fig. 73



Item	Qty.	Part Description	Part Number
1	1	Scissor Assembly, 8 ft. long	6008380
	1	Scissor Assembly, 10 ft. long	6008401
	1	Scissor Assembly, 12 ft. long	6008388
2	4	DU Bearing, 1-1/4" I.D.	6005147
3	4	Pin, Rear Scissor, 1-1/4" Dia.	6008327
4	4	Cam Follower, 2-1/2" Roller Dia, 8 ft. units	6005190
	4	Cam Follower, 3" Roller Dia, 10 and 12 ft. units	6005493
5	4	Hex Nut, 1-14 Thread, 8 ft. units	6008378
	4	Hex Nut, 1-1/4-12 Thread, 10 and 12 ft. units	6008384
6*	1	Scissor Frame Assembly, 8 ft. long, Remote Mount	6005401

PARTS LIST, continued

Scissor assembly

Item	Qty.	Part Description	Part Number
6*	1	Scissor Frame Assembly, 8 ft. long, Remote Mount	6005401
	1	Scissor Frame Assembly, 10 ft. long, Remote Mount	6005591
	1	Scissor Frame Assembly, 12 ft. long, Remote Mount	6005588
	1	Scissor Frame Assembly, 8 ft. long, Pit Mount	6008877
	1	Scissor Frame Assembly, 10 ft. long, Pit Mount	6008878
	1	Scissor Frame Assembly, 12 ft. long, Pit Mount	6008879
7	2	Safety Stop Block Assembly, 8 ft. units	6008419
	2	Safety Stop Block Assembly, 10 ft. units	6008790
	2	Safety Stop Block Assembly, 12 ft. units	6008443
8	2	Label, Maintenance Device	921234
9	2	Label, Danger, Use of Maintenance Device	6007074
10	2	Label, Danger, Lift	6003451
11	2	Label, Pinch Point	6007121
12	2	Retaining Ring, Main Scissor Pin	6008377
13	4	Deck Support Leg / Keeper Assy, 20" Lip, 10 and 12 ft. units	6008392
14	4	Label, Danger, Maintenance Strut	921074
15	4	Label, Danger, Entering Pit	921070
16**	2	Shipping Rod, Rear, 5/8-11 x 21" long	6008445
17**	4	Lifting Nut Assembly	6008368
18**	4	Pin, Lifting, 1" Dia.	6008415
19**	6	Hex Head Machine Bolt, 3/4-10 x 4" Long	212321
20**	2	Shipping Rod, Front, 5/8-11 x 25" long	6008446

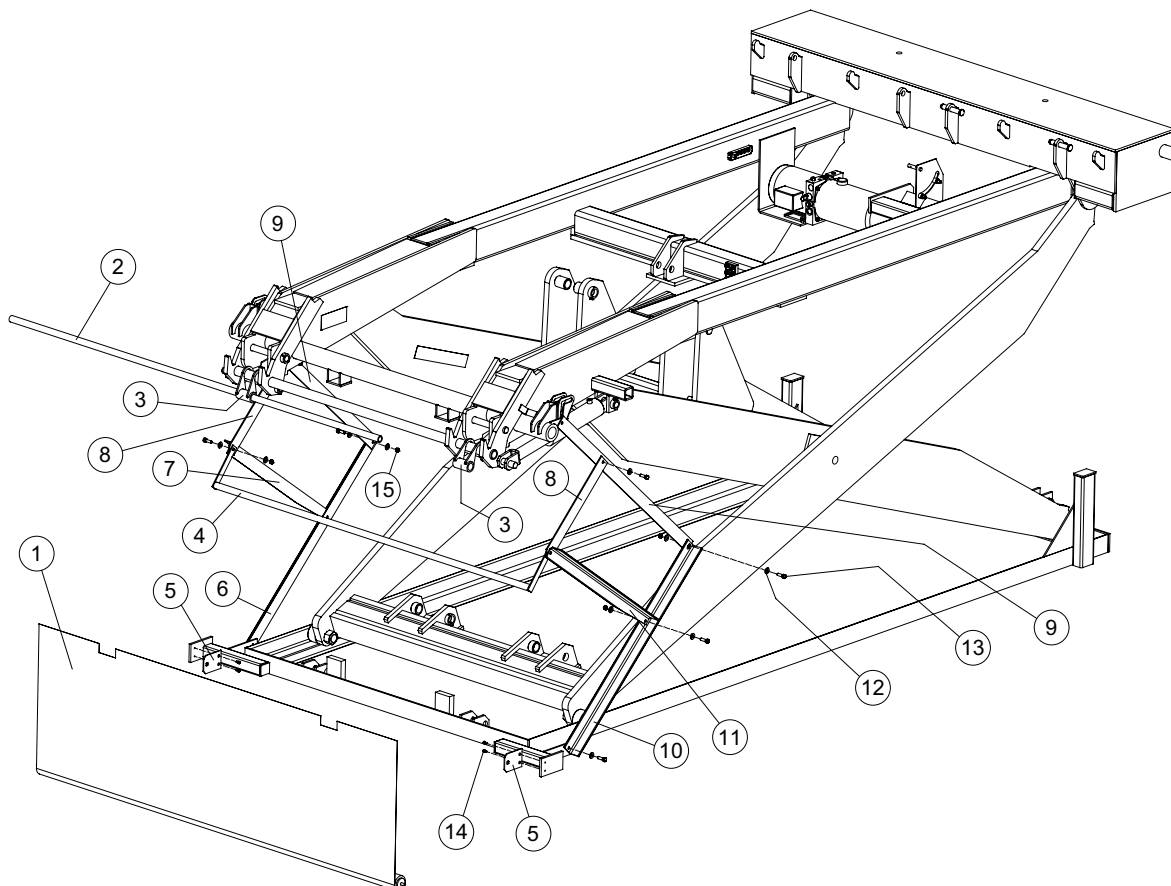
* Note: Item 6 is referenced by the location of the scissor power unit; remote mounted or pit mounted.

**Note: Items 16-20 are used for shipping and installing purposes only.

PARTS LIST, continued

Roller curtain and push rod

Fig. 74



Item	Qty.	Part Description	Part Number
1	1	Roller Curtain, 6 ft. wide	6008408
	1	Roller Curtain, 6.5 ft. wide	6008409
	1	Roller Curtain, 7 ft. wide	6008410
2	1	Curtain Rod, 6 ft. wide	6008335
	1	Curtain Rod, 6.5 ft. wide	6008411
	1	Curtain Rod, 7 ft. wide	6008412
3	2	Curtain Hook	6008338
4	1	Pushrod, 6 ft. wide, 18" lip	6009344
	1	Pushrod, 6.5 ft. wide, 18" lip	6009345
	1	Pushrod, 7 ft. wide, 18" lip	6009346
	1	Pushrod, 6 ft. wide, 20" lip	6009347
	1	Pushrod, 6.5 ft. wide, 20" lip	6009348
	1	Pushrod, 7 ft. wide, 20" lip	6009349
5	2	Curtain Mounting Plate	6008444
6	1	Pushrod Support Angle, Lower, Left	6005174
7	1	Pushrod Support Angle, Mid, Left	6005171
8	2	Pushrod Cross Support	6005177

PARTS LIST, continued

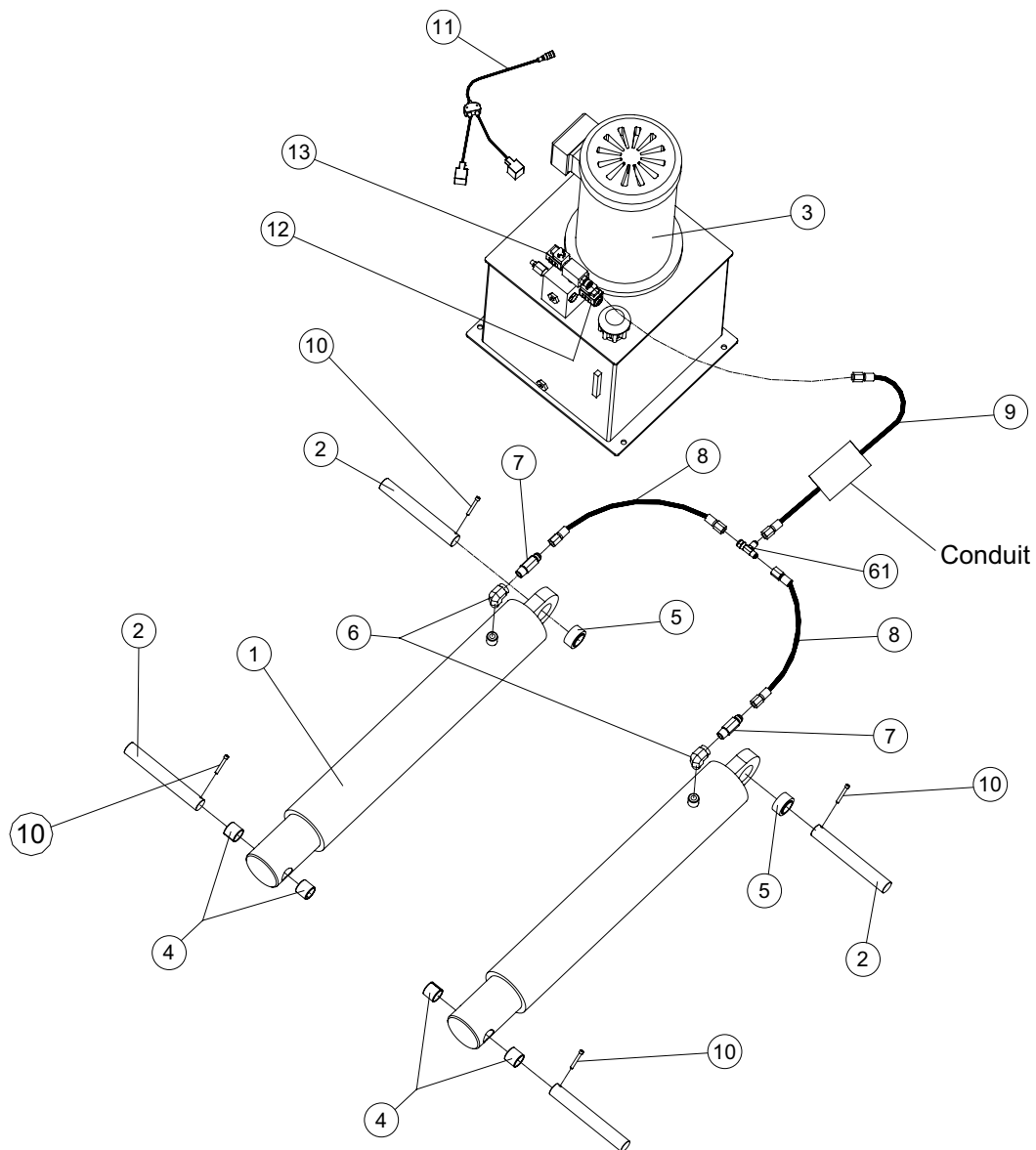
Roller curtain and push rod

Item	Qty.	Part Description	Part Number
9	2	Pushrod Support Plate, Upper	6005179
10	1	Pushrod Support Angle, Lower, Right	6005178
11	1	Pushrod Support Angle, Mid, Right	6005172
12	42	Plain Washer, 3/8"	000214
13	12	Bolt, Hex Head, 3/8-16 x 1-1/4" long	000357
14	4	Socket Head Cap Screw, 3/8-16 x 3/4" long	000860
15	12	Lock Nut, 3/8-16	000030

PARTS LIST, continued

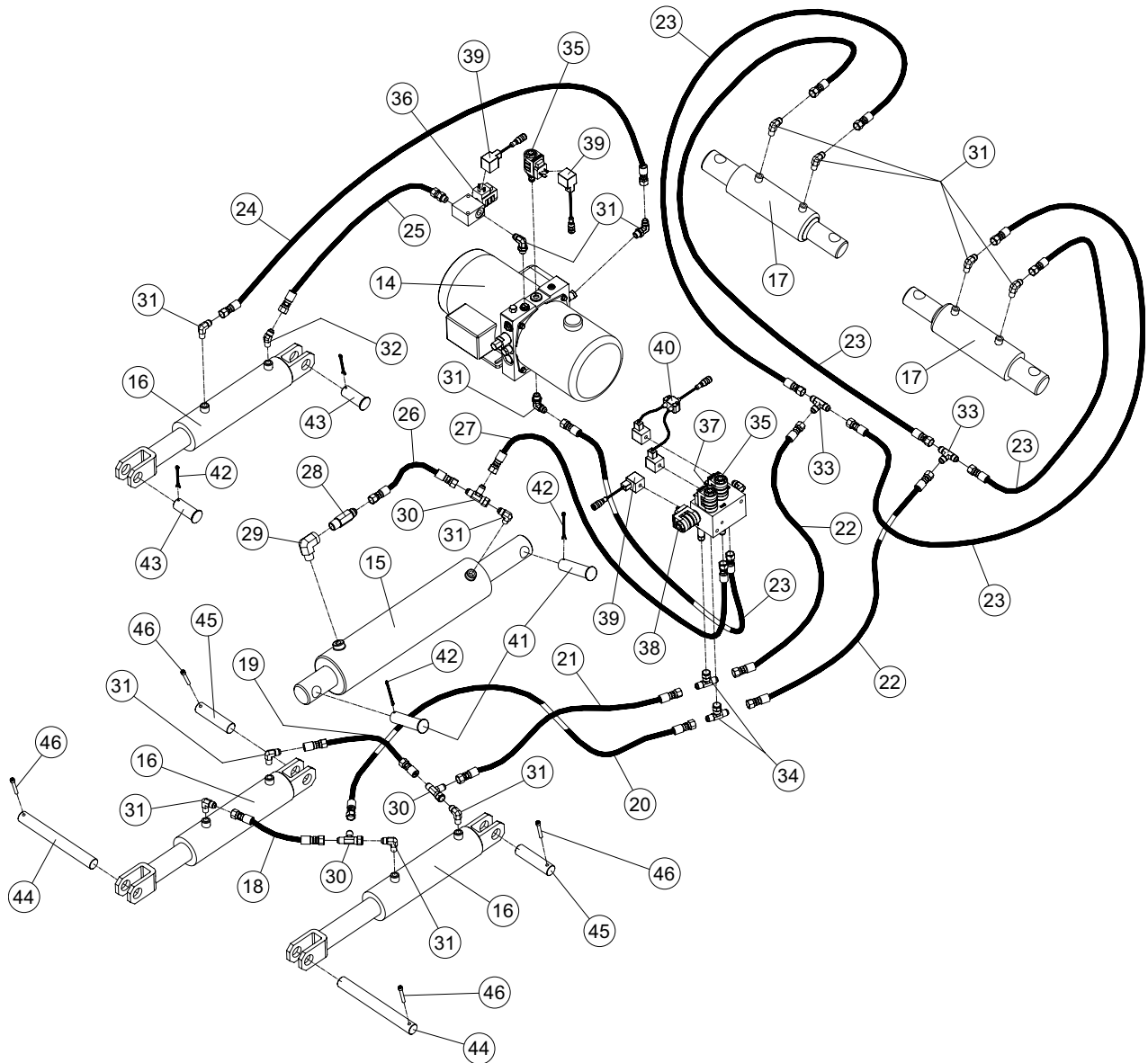
Hydraulic and electrical

Fig. 75



PARTS LIST, continued Hydraulic and electrical

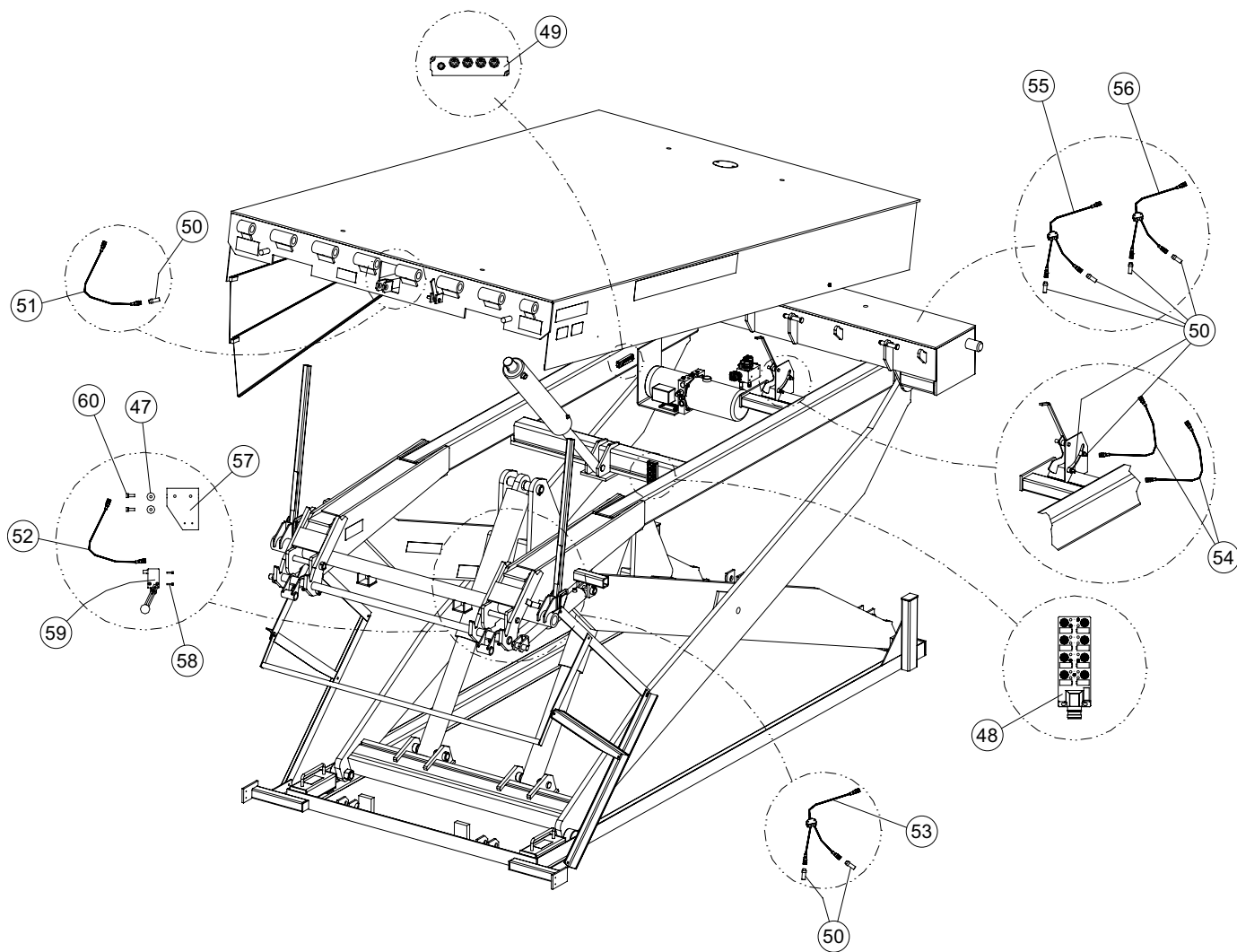
Fig. 76



PARTS LIST, continued

Hydraulic and electrical

Fig. 77



PARTS LIST, continued

Hydraulic and electrical

Item	Qty.	Part Description	Part Number
1	2	Scissor Lift Cylinder, 8 ft. long	6005439
	2	Scissor Lift Cylinder, 10 ft. long	6005461
	2	Scissor Lift Cylinder, 12 ft. long	6005462
2	4	Pin, Scissor Cylinder, 1-1/4" Dia.	6005277
3	1	Remote Mounted Scissor Power Unit, 208 Volt	6009350
	1	Remote Mounted Scissor Power Unit, 240 Volt	6009351
	1	Remote Mounted Scissor Power Unit, 480 Volt	6008423
	1	Remote Mounted Scissor Power Unit, 600 Volt	6009352
	1	Pit Mounted Scissor Power Unit, 208 Volt (not shown)	6009353
	1	Pit Mounted Scissor Power Unit, 240 Volt (not shown)	6009354
	1	Pit Mounted Scissor Power Unit, 480 Volt (not shown)	6008739
	1	Pit Mounted Scissor Power Unit, 600 Volt (not shown)	6009355
4	4	DU Bearing, 1-1/4" I.D.	6005147
5	2	Spherical Bearing, 1-1/4" I.D.	6008320
6	2	Fitting, Street Elbow	313102
7	2	Velocity Fuse, 10 G.P.M.	313239
8	2	Hydraulic Hose, 1/2" I.D., 30" long	6001899
9	1	Hydraulic Hose, 1/2" I.D., Remote mount, 8 ft. units	711229
	1	Hydraulic Hose, 1/2" I.D., Remote mount, 10 and 12 ft. units	711228
	1	Hydraulic Hose, 1/2" I.D., Pit mount, all units (not shown)	6006897
10	4	Socket Head Cap Screw, 1/4-20 x 2" long	000369
11	1	Electrical Cable, Lift Solenoids, Remote Mounted	6008734
	1	Electrical Cable, Lift Solenoids, Pit Mounted (not shown)	6008735
12	1	Lift Solenoid, Lower	6009356
13	1	Lift Solenoid, Raise	6009357
14	1	Leveler Hydraulic Power Unit, 208 - 480V / Three Phase	313549
	1	Leveler Hydraulic Power Unit, 575V / Three Phase	313550
15	1	Deck Lift Cylinder, 8 ft. units	313046
	1	Deck Lift Cylinder, 10 and 12 ft. units	313563
16	3	Lip / Keeper Cylinder	313043
17	2	Lock Pin Cylinder	6003030
18	1	Hose Assy, Keeper Cylinder, Retract Tee, 6 ft. wide units	35482
	1	Hose Assy, Keeper Cylinder, Retract Tee, 6.5 ft. wide units	35482
	1	Hose Assy, Keeper Cylinder, Retract Tee, 7 ft. wide units	34521
19	1	Hose Assy, Keeper Cylinder, Extend Tee, 6 ft. wide units	35482
	1	Hose Assy, Keeper Cylinder, Extend Tee, 6.5 ft. wide units	35482
	1	Hose Assy, Keeper Cylinder, Extend Tee, 7 ft. wide units	34521

PARTS LIST, continued

Hydraulic and electrical

Item	Qty.	Part Description	Part Number
20	1	Hose Assy, Keeper Retract to Manifold, 8 ft. units	35482
	1	Hose Assy, Keeper Retract to Manifold, 10 ft. units	34521
	1	Hose Assy, Keeper Retract to Manifold, 12 ft. units	31357
21	1	Hose Assy, Keeper Extend to Manifold, 8 ft. units	33637
	1	Hose Assy, Keeper Extend to Manifold, 10 ft. units	35482
	1	Hose Assy, Keeper Extend to Manifold, 12 ft. units	34521
22	2	Hose Assy, Manifold to Lock Pin Tee	31961
23	5	Hose Assy, Lock Pin to Tee / Manifold to Power Unit	31955
24	1	Hose Assy, Lip Retract, 8 ft. units	33637
	1	Hose Assy, Lip Retract, 10 ft. units	35482
	1	Hose Assy, Lip Retract, 12 ft. units	35483
25	1	Hose Assy, Lip Extend, 8 ft. units	33637
	1	Hose Assy, Lip Extend, 10 ft. units	35482
	1	Hose Assy, Lip Extend, 12 ft. units	34521
26	1	Hose Assy, Main Cylinder, 8 ft. units	313544
	1	Hose Assy, Main Cylinder, 10 and 12 ft. units	313545
27	1	Hose Assy, Main Cylinder to Manifold, 8 ft. units	6000724
	1	Hose Assy, Main Cylinder to Manifold, 10 ft. units	6000724
	1	Hose Assy, Main Cylinder to Manifold, 12 ft. units	33641
28	1	Velocity Fuse, 10 G.P.M	313239
29	1	Fitting, Street Elbow	313102
30	3	Fitting, Run Tee	313105
31	12	Fitting, Elbow	313106
32	1	Fitting, Male, 45° Elbow	313219
33	2	Fitting, Tee, Male	6000595
34	2	Fitting, Swivel Nut Branch Tee	313246
35	2	Solenoid Valve Assy (SV1 and SV3)	6008755
36	1	Solenoid Valve Assy (SV2)	6003815
37	1	Solenoid Valve Assy (SV4)	6008756
38	1	Solenoid Valve Assy (SV5)	6008757
39	3	Electrical Cable, Solenoid, .3 meter	6008052
40	1	Electrical Cable, Solenoid, 1.2 meter	6008054
41	2	Pin, Deck Cylinder	5861066
42	4	Cotter Pin, 5/32" x 2" long	6001832
43	2	Pin, Lip Cylinder	5861063

PARTS LIST, continued

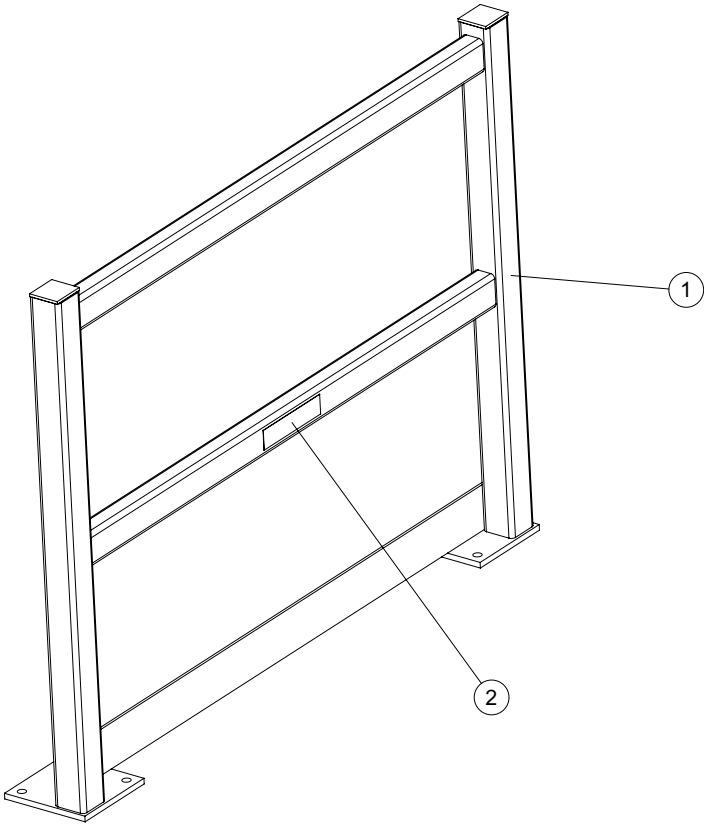
Hydraulic and electrical

Item	Qty.	Part Description	Part Number
44	2	Pin, Lip Keeper, Front, 8 ft. units	6005496
	2	Pin, Lip Keeper, Front, 10 and 12 ft. units	6008407
45	2	Pin, Lip Keeper, Rear, 8 ft. units	6008328
	2	Pin, Lip Keeper, Rear, 10 and 12 ft. units	6008405
46	4	Socket Head Cap Screw, 1/4-20 x 2" long	000369
47	2	Plain Washer, 3/8"	234101
48	1	8 Port Sensor Junction Box	6008672
49	1	4 Port Solenoid Junction Box	6008051
50	9	18 mm Proximity Switch	6008404
51	1	Lip Pendant Cable, QD, 4 meters long, 8 ft. units	6008695
		Lip Pendant Cable, QD, 5 meters long, 8 ft. units	6008696
		Lip Pendant Cable, QD, 7 meters long, 8 ft. units	6008698
52	1	Dock Height Sensor Cable, QD, 2 meters long, all units	6008692
53	1	Keeper / Leg Sensor Cable, QD, all units	6000595
54	2	Deck Level Sensor Cable, QD, 2 meters long, all units	6008692
55	1	Lock Pins Extended Sensor Cable, all units	6008738
56	1	Lock Pins Retracted Sensor Cable, all units	6008737
57	1	Mount Plate, Dock Height Switch	6008440
58	2	Socket Head Cap Screw, 8-32 x 1" long	000342
59	1	Dock Height Limit Switch	6008438
60	2	Socket Head Cap Screw, 3/8-16 x 1" Long	000114
61	1	Fitting, Tee, Male 1/2"	031390

PARTS LIST, continued

Guard Rail

Fig. 78

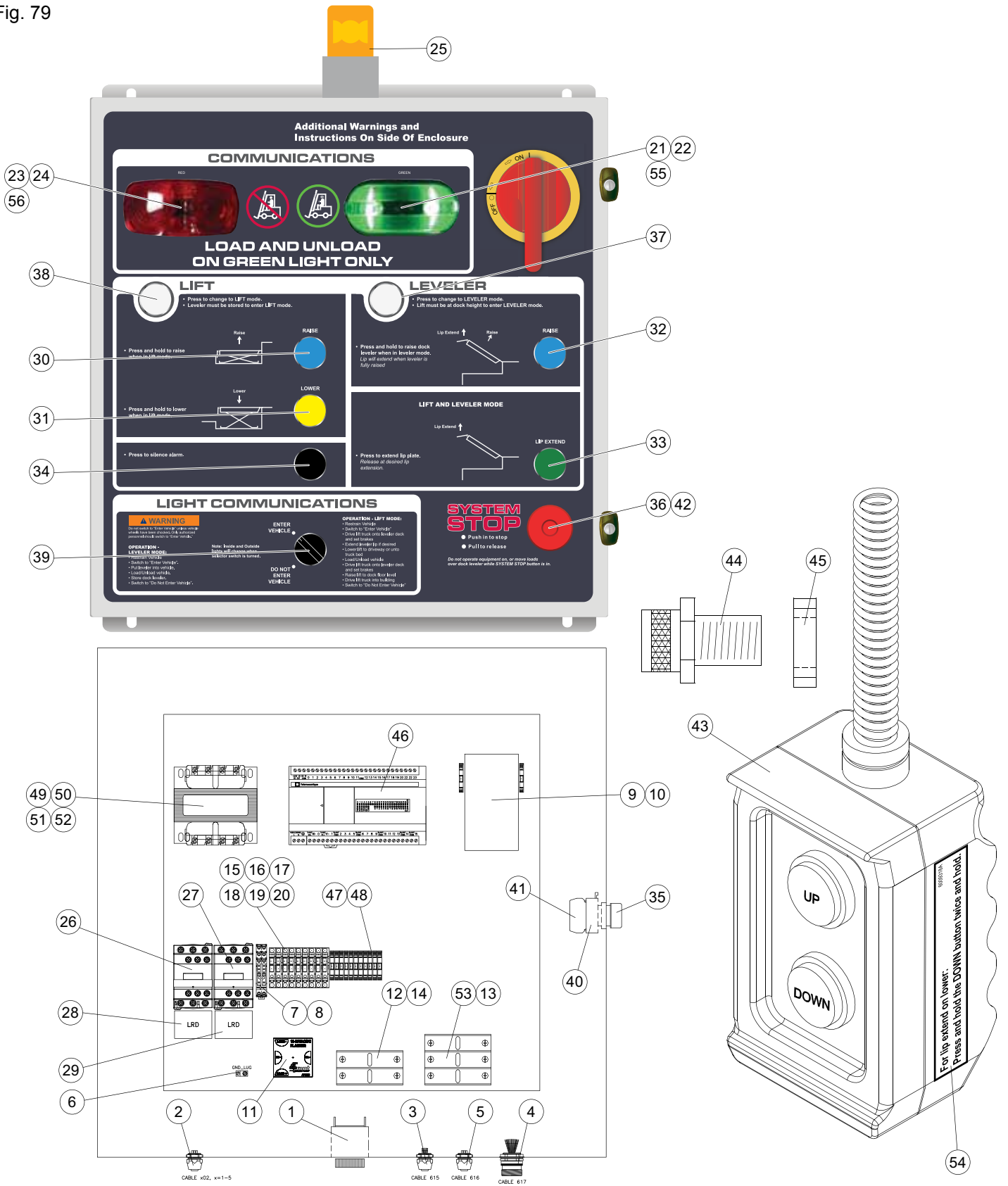


Item	Qty.	Part Description	Part Number
1	4	Guard Rail, 800, 31" Rail Length Guard Rail, 1000, 43" Rail Length Guard Rail, 1200, 55" Rail Length	6008420 6008421 6008422
2	4	Label, Warning, Guard Rail	6008880

PARTS LIST, continued

Control Panel and Pendant

Fig. 79



PARTS LIST, continued

Control Panel and Pendant

Item	Qty.	Part Description	Part Number
1	1	Audible Alarm, 10-48 VAC	823109
2	1	Panel Receptacle, 4-Pin, Leveler Power	6009533
3	1	Panel Receptacle, 8-Pin, Leveler Solenoid Signals	6009534
4	1	Panel Receptacle, 19-Pin, Sensor Signals	6009535
5	1	Panel Receptacle, 4-Pin, Lift Solenoid Signals	6009536
6	1	Ground Bar	6000559
7	1	Relay, 2 Pole, 24 VAC	6000518
8	1	Relay Base, 2 Pole	6000522
9	1	Rotary Disconnect, 30 Amp	6008283
10	3	Fuse, LP-CC-30 (208 V & 240 V units) Fuse, LP-CC-20 (380 V & 480 V units) Fuse, LP-CC-15 (600 V units)	6009537 6009538 6009539
11	1	Flasher, 4 Wire, 10-30 VAC/VDC	6009541
12	1	Fuse Block, 3 Pole	BC633P
13	3	Fuse, LP-CC-5 (208 V & 240 V units) Fuse, LP-CC-4 (380 V & 480 V units) Fuse, LP-CC-2 (600 V units)	6009542 6009543 6009544
14	2	Fuse, FNQ-R-4 (208 V & 240 V units) Fuse, FNQ-R-2 (380 V, 480 V units & 600 V units)	6009545 6009546
15	9	Terminal Block, Fused Disconnect	6000538
16	1	Fuse, AGC-1/4	6009547
17	1	Fuse, MDA-1	6009548
18	5	Fuse, MDA-2	6009549
19	1	Fuse, MDA-3	6009550
20	1	Fuse, MDA-8	6009551
21	1	LRU, Green, 10-28 VAC/VDC	6006377
22	1	Oval base (green lens)	823111
23	1	Rectangle base (red lens)	823107
24	1	LRU, Red, 10-28 VAC/VDC	6006375
25	1	Strobe, Amber, 120 VAC	6009552
26	1	Contactor, Leveler Motor	6000457
27	1	Contactor, Lift Motor	6000458

PARTS LIST, continued

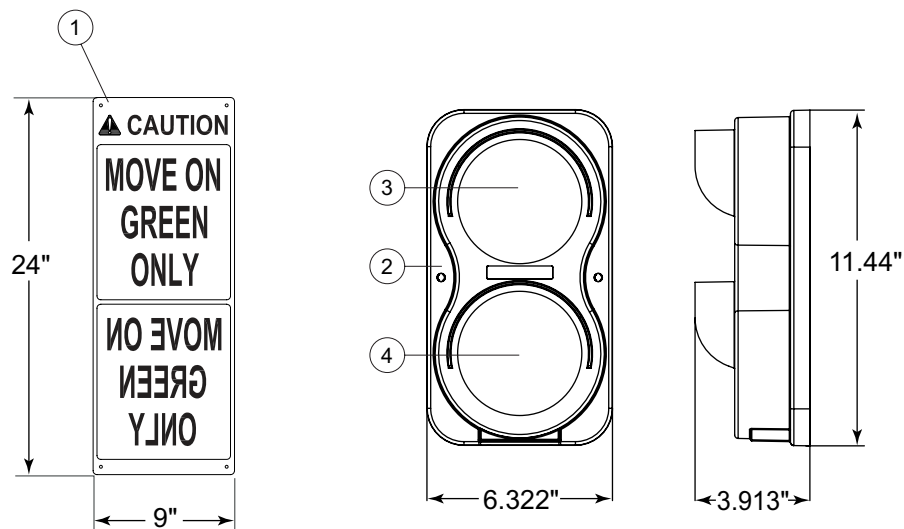
Control Panel and Pendant

Item	Qty.	Part Description	Part Number
28	1	Relay, Overload, 1.6 - 2.5 Amp	6000473
29	1	Relay, Overload, 9 - 13 Amp	6000477
30	1	Push Button, Lift Raise, Blue	6000506
31	1	Push Button, Lift Lower, Yellow	6000506
32	1	Push Button, Leveler Raise, Blue	6000506
33	1	Push Button, Lip Extend, Green	6000506
34	1	Push Button, Silence Alarm, Black	6000506
35	1	Push Button, Reset, Red	6000506
36	1	Push Button, Mushroom Style, Stop	632215
37	1	Push Button, Illuminated, Leveler Mode, White	6007728
38	1	Push Button, Illuminated, Lift Mode, White	6007728
39	1	Selector Switch, Maintained, 2 Position	632217
40	10	Body, Mounting Collar	6000515
41	9	Block, Contact, Normally Open	632228
42	2	Block, Contact, Normally Closed (Stop Button)	632229
43	1	Pendant Station, Up / Down Controller	6009553
44	1	Cord Grip, 1/2" Conduit, Pendant	6006860
45	1	Lock Nut, 1/2", Pendant	6006864
46	1	Twido PLC,	6008746
47	11	Terminal Block, 4 Conductor	6006846
48	3	Terminal Block, 2 Conductor	6000542
49	1	Transformer, 208 V to 120 / 24 V (208 V units)	6006830
50	1	Transformer, 240/480 V to 120 / 24 V (240 & 480 V units)	6006814
51	1	Transformer, 380 V to 120 / 24 V (208 V units)	6009554
52	1	Transformer, 600 V to 120 / 24 V (208 V units)	6006818
53	1	Fuse Block	6008859
54	1	Label, pendant operation	6009318
55	1	Green lens	AP0027
56	1	Red lens	823100

PARTS LIST, continued

Lights and Signs

Fig. 80



Item	Quantity	Part Description	Part Number
1	1	Outside Sign – Normal and Reverse Lettering	709-832
2	1	Light Assembly - Complete (LEDs)	6007798
3*	1	Red LED Light Assy.	6007800
4*	1	Green LED Light Assy.	6007801

* Part of Item 2 (Light Assembly – Complete).

NOTES

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal black lines across the entire width of the page, typical of notebook or legal stationery. The background is a solid off-white color. There are no margins, text, or other markings present.

This image shows a full page of blank white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for writing or drawing. There are no margins, text, or other markings present.

LIMITED WARRANTY

THIS LIMITED WARRANTY IS 4FRONT'S SOLE AND EXCLUSIVE WARRANTY WITH RESPECT TO THE DOCK LEVELER AND LIFT COMBO AND IS IN LIEU OF ANY OTHER GUARANTEES OR WARRANTIES, EXPRESS OR IMPLIED

4FRONT warrants that this DOCK LEVELER AND LIFT COMBO will be free from flaws in material and workmanship under normal use for a period of one (1) year from the earlier of 1) 60 days after the date of initial shipment by 4FRONT, or 2) the date of installation of the DOCK LEVELER AND LIFT COMBO by the original purchaser, provided that the owner maintains and operates the DOCK LEVELER AND LIFT COMBO in accordance with this Owner's Manual.

4FRONT expressly warrants that the MOTOR, GASKETS, FITTINGS and SEALS will be free from flaws in material and workmanship under normal use for a period of five (5) years from the earlier of 1) 60 days after date of shipment, or 2) the date of installation of the DOCK LEVELER AND LIFT COMBO by the original purchaser, provided the purchaser maintains and operates the DOCK LEVELER AND LIFT COMBO in accordance with the Owner's Manual.

In the event that this DOCK LEVELER AND LIFT COMBO proves deficient in material or workmanship within the applicable Limited Warranty period, owner shall so notify 4FRONT, and 4 Front will, at its option:

1. Replace the DOCK LEVELER AND LIFT COMBO, or the deficient portion(s) thereof, without charge to the owner; or
2. Alter or repair the DOCK LEVELER AND LIFT COMBO, on site or elsewhere, without charge to the owner.

This Limited Warranty does not cover any failure caused by improper installation, abuse, improper operation, negligence, or failure to maintain and adjust the DOCK LEVELER AND LIFT COMBO properly. Parts requiring replacement due to damage resulting from vehicle impact, abuse, or improper operation are not covered by this warranty. 4FRONT DISCLAIMS ANY RESPONSIBILITY OR LIABILITY FOR ANY LOSS OR DAMAGE OF ANY KIND (INCLUDING WITHOUT LIMITATION, DIRECT, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES, OR LOST PROFITS OR LOST PRODUCTION) arising out of or related to the use, installation or maintenance of the DOCK LEVELER AND LIFT COMBO (including premature product wear, product failure, property damage or bodily injury resulting from use of unauthorized replacement parts or modification of the DOCK LEVELER AND LIFT COMBO). 4FRONT's sole obligation with regard to a DOCK LEVELER AND LIFT COMBO that is claimed to be deficient in material or workmanship shall be as set forth in this Limited Warranty. This Limited Warranty will be null and void if the original purchaser does not notify 4FRONT's warranty department within ninety (90) days after the product deficiency is discovered. .

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING, BUT NOT LIMITED TO, A WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH 4FRONT HEREBY DISCLAIMS.

Please direct questions about your dock leveler and lift combo to your local distributor or to 4Front Engineered Solutions, Inc.

Your local 4Front Engineered Solutions, Inc. distributor is:

Corporate Head Office:

1612 Hutton Dr. Suite 140
Carrollton, TX. 75006
Tel. (972) 466-0707
Fax (972) 323-2661